UNITED STATES MARINE CORPS

FINAL

SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

SEWAGE EFFLUENT COMPLIANCE PROJECT
LOWER SANTA MARGARITA BASIN
MARINE CORPS BASE CAMP PENDLETON
SAN DIEGO COUNTY, CALIFORNIA

DECEMBER 1998

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United States Marine Corps

Final
Supplemental Environmental Impact Statement

Sewage Effluent Compliance Project
Lower Santa Margarita Basin
Marine Corps Base Camp Pendleton
San Diego County, California

December 1998

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Sewage Effluent Compliance Project
Lower Santa Margarita Basin
Marine Corps Base Camp Pendleton

ABSTRACT

The purpose of the Proposed Action is to secure sewage effluent discharge compliance with the Cease and Desist Order issued by the San Diego Regional Water Quality Control Board (RWQCB) at existing Sewage Treatment Plants (STPs) 1, 2, 3, 8, and 13 within the Lower Santa Margarita Basin. Compliance with the Cease and Desist Order would in turn allow for compliance with the San Diego Water Quality Control Plan (Basin Plan), thereby enhancing water quality within the Basin and providing long-term protection of the aquifer at Marine Corps Base (MCB) Camp Pendleton. The portion of the Proposed Action analyzed in the Final Environmental Impact Statement/Report (FEIS/R) and approved in the Record of Decision involves the construction of new facilities to convey sewage from the STPs downstream through a system of pumps and pipelines to percolation ponds in the Lemon Grove area of MCB Camp Pendleton. The ultimate disposal of the effluent, which may include advanced treatment, is considered in detail in this Final Supplementary Environmental Impact Statement (FSEIS). Alternative 1 would provide facilities for discharge of secondary effluent, after irrigation of the Marine Memorial Golf Course, by enhancement of the Lemon Grove ponds with cased vertical drains filled with sand and gravel. Alternative 2 would add advanced wastewater treatment of effluent from STPs 1 and 2, for irrigation of the Marine Memorial Golf Course, with the excess to the Lemon Grove ponds with cased vertical drains. The total effluent from STPs 3, 8 and 13 would be disposed at the Lemon Grove ponds with cased vertical drains. Alternative 3 would provide tertiary treatment and nutrient removal for STP 13 effluent, blending with secondary effluent from STPs 1, 2, 3, and 8, with discharge at the Ysidora Flats section of the Santa Margarita River, after irrigation of the Marine Memorial Golf Course. Alternative 4 would provide advanced wastewater treatment facilities for disposal of the total volume of effluent, after irrigation of the Marine Memorial Golf Course, by gravity injection wells at the Lemon Grove ponds. Alternative 5 would provide advanced wastewater treatment for all effluent for use in the irrigation of the Marine Memorial Golf Course and existing on-Base leased agricultural lands, with the excess disposed by injection wells at the Lemon Grove ponds. The impacts evaluated in this SEIS are Hydrology and Water Quality, Cultural Resources, Biological Resources, Public Health and Safety, Socioeconomics, Environmental Justice, Geology and Soils, Air Quality, Land Use, Noise, Transportation and Vehicular Circulation, Visual Resources, and Utilities.

Prepared by:

Commanding General
United States Marine Corps
Marine Corps Base Camp Pendleton
San Diego County, California

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SUMMARY

This Final Supplemental Environmental Impact Statement (FSEIS) was prepared to evaluate the potential environmental impacts of proposed alternative actions developed to dispose of sewage effluent in the Lower Santa Margarita Basin at Marine Corps Base (MCB) Camp Pendleton, California in compliance with orders and requirements of the San Diego Regional Water Quality Control Board (RWQCB) and other cognizant agencies.

This document is a supplement to the *Final Environmental Impact Statement/Report, Sewage Effluent Compliance Project, Lower Santa Margarita Basin, Marine Corps Base Camp Pendleton, San Diego County, California, April 1997*, hereafter referred to as the FEIS/R. On August 26, 1997, the Department of the Navy announced its decision to upgrade the wastewater treatment and disposal systems in the Santa Margarita Basin of MCB Camp Pendleton. This project was initiated in response to a Cease and Desist Order issued to MCB Camp Pendleton by the San Diego RWQCB. Effluent discharged did not meet California State water quality standards. The new facilities to be constructed included a new 22 acre percolation basin in the Lemon Grove area of MCB Camp Pendleton and pipelines to connect five existing sewage treatment plants (STPs). A portion of the effluent was to be disposed via the new percolation basin, though the majority of the flow was to be disposed via the City of Oceanside La Salina ocean outfall. On September 3, 1997, the City of Oceanside decided to deny the Marine Corps use of the La Salina ocean outfall. The need for the Lemon Grove percolation basin and connecting pipelines to the STPs still existed. The Department of the Navy commenced with construction activities. Specifically, construction of 82,000 feet of pipeline to connect the five STPs and the new Lemon Grove percolation pond was initiated. However, a new solution was required for disposal of flows that were to be accommodated by the La Salina ocean outfall. Accordingly, the Marine Corps began to explore options for disposal of this flow.

PURPOSE AND NEED

The purpose of this FSEIS is to evaluate alternatives for final disposal methods of sewage effluent in order to comply with the RWQCB Cease and Desist Orders by the May, 1999 deadline. The FEIS/R ROD of August 26, 1997, (see Appendix D), selected the City of Oceanside outfall as the final disposal method. Subsequent to the FEIS/R ROD, the City of Oceanside denied the Marine Corps' use of the excess capacity of their outfall.

In accordance with the ROD, installation of approximately 82,000 lineal feet of pipelines to connect STP 1, 2, 3, 8, and 13 and the Lemon Grove ponds has been completed, and construction has begun on the 22 acre wastewater discharge ponds at Lemon Grove. The portion of the ROD which was not implemented, was the installation of approximately 16,000 lineal feet of connecting pipeline to the City of Oceanside's outfall.

PROJECT LOCATION

The proposed action is located within portions of the Lower Santa Margarita and San Luis Rey Basins, and wholly within MCB Camp Pendleton, San Diego County, California. The areas of study for this FSEIS include the Lemon Grove/STP 13, Ysidora Flats and STP 2 areas of MCB Camp Pendleton (Figure 1-3).

ALTERNATIVES CONSIDERED/PREFERRED ALTERNATIVE

Three broad categories of sewage effluent disposal alternatives were considered: ocean disposal, surface and groundwater disposal, and land disposal. Ocean disposal would include the discharge of effluent directly into ocean waters via an ocean outfall or surf discharge; surface and groundwater disposal would involve the discharge of effluent directly or indirectly into rivers and floodplains, lakes, streams, and groundwater aquifers; and land disposal would involve the discharge of treated effluent to the land, including irrigation of landscaping, recreational areas, and agriculture. In addition, the No Action Alternative was evaluated. Each alternative was evaluated in terms of engineering issues, environmental issues, permitting requirements and the constraints of military project funding and contracting.

In addition to new alternatives, alternatives that had been considered and rejected for the FEIS/R were reexamined, as well as new locations for effluent percolation ponds. With one exception, alternatives that would result in many years of delay in compliance because of the need for extensive studies and new funding from the Military Construction (MCON) program were eliminated as not meeting the Purpose and Need of the project. Alternative 3 was developed in response to comments received from federal and state agencies and private parties who encouraged the upstream reuse of treated effluent as a preferable alternative to discharge near or in the ocean. Upstream reuse is also consistent with the long-term goals of MCB Camp Pendleton. Based upon an analysis of the additional costs to achieve nutrient removal in conjunction with tertiary treatment of the effluent from STP 13 included in Alternative 3, this alternative cannot be accomplished within the level of funding Congress has authorized to construct this project. Alternative 3 would be a short-term solution for tertiary treatment of a portion of the total effluent. As a long term solution, MCB Camp

Pendleton intends to seek funding for tertiary treatment and nutrient removal capabilities (as required) for all facilities. Alternative 3 was retained for detailed analysis to further investigate the concept of upstream effluent use and its viability for future implementation. Alternative 2 would be feasible with current funding, and has been designated the Preferred Alternative.

All six alternatives carried through for detailed analysis in this FSEIS, including the No Action Alternative, provide for irrigation of the Marine Memorial Golf Course and utilization of the existing percolation/equalization Lemon Grove ponds and pipelines. The basic parameters of each alternative are summarized in Table S-1. The maximum flow of effluent from STPs 1, 2, 3, 8, and 13 during the rainy season would be approximately 3.6 MGD. The design flow of STP 1 is 0.54 MGD, STP 2 is 0.35 MGD, STP 3 is 0.55 MGD, STP 8 is 0.10 MGD and STP 13 is 2.0 MGD. Effluent from STPs 1 and 2 would primarily be used to irrigate the Marine Memorial Golf Course. That portion of effluent not used for this irrigation would be conveyed to the Lemon Grove Ponds.

Table S-1
Alternatives Considered in Detail

Phase	STP	Design Flow	Treatment Level	Disposal Site	Disposal Method	Construction Time	Compliance with Cease & Desist Order
Alternative 1							
1	1, 2, 3, 8, 13	3.6 MGD	Secondary	Base golf course and Lemon Grove ponds	Irrigation and Vertical drains	6 months	Yes
Alternative 2							
1	1, 2, 3, 8, 13	3.6 MGD	Secondary	Base golf course and Lemon Grove ponds	Irrigation and Vertical drains	6 months	Yes
2	1, 2	0.9 MGD	AWT	Base golf course and Lemon Grove ponds	Irrigation with excess to vertical drains	15 months	
	3, 8, 13	2.65 MGD	Secondary	Lemon Grove ponds	Vertical drains		
Alternative 3							
1	13	2.0 MGD	Tertiary (Nutrient removal)	Ysidora Flats	Blended for groundwater recharge	24 months	No
	1, 2, 3, 8	1.54 MGD	Secondary	Base golf course and Lemon Grove ponds	Irrigation and vertical drains		
Alternative 4							
1	1, 2, 3, 8, 13	3.6 MGD	AWT	Base golf course and Lemon Grove ponds	Irrigation and gravity cased injection wells	18 months	No
Alternative 5							
1	1, 2, 3, 8, 13	3.6 MGD	AWT	Base golf course, on-Base agriculture fields and Lemon Grove ponds	Golf course and crop irrigation and gravity injection wells (excess only)	20 months	No

AWT - Advanced water treatment

Alternative 1: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains

With implementation of Alternative 1, effluent from STPs 1 and 2 (0.9 MGD) would be used to irrigate the Marine Memorial Golf Course, with the unused portion conveyed to the Lemon Grove ponds. The total effluent from STPs 3, 8, and 13, (2.7 MGD) would be conveyed to the Lemon Grove ponds, which are under construction per the FEIS/R ROD. Cased vertical drains would be constructed within the Lemon Grove ponds to discharge the effluent to the groundwater. Without these drains, there would be inadequate percolation capacity for the total effluent. Design and construction of Alternative 1 would take approximately six months, with the system being operational in the year 1999. Therefore, this alternative would achieve compliance with the RWQCB Cease and Desist Orders by the May, 1999 deadline.

Alternative 2: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains plus Advanced Wastewater Treatment and Reclamation of a Portion of the Effluent (Preferred Alternative)

Alternative 2 would be implemented in two phases. With implementation of Phase 1, the effluent from STPs 1 and 2 (0.9 MGD), after irrigation of the Marine Memorial Golf Course, and STPs 3, 8 and 13 (2.7 MGD), would be conveyed to the Lemon Grove ponds, which are under construction per the FEIS/R ROD. Vertical drains would be constructed within the Lemon Grove ponds to discharge the effluent to the groundwater. Design and construction of Phase 1 would take approximately six months, with the system being operational in the year 1999. Therefore, this alternative would achieve compliance with the RWQCB Cease and Desist Orders by the May, 1999 deadline.

Phase 2 would add a system for advanced wastewater treatment[1] of the effluent from STPs 1 and 2 (0.9 MGD). The secondary effluent from STPs 3, 8 and 13 (2.7 MGD) would be conveyed to the Lemon Grove Ponds, which were previously constructed per the FEIS/R ROD. The treated effluent from STPs 1 and 2 would be used to irrigate the Marine Memorial Golf Course, with the unused portion conveyed to the Lemon Grove ponds. A valve would be installed in the pipeline adjacent to Vandegrift Boulevard at Ysidora Flats to enable future delivery of the advanced treatment effluent to the BRAC and Levee wetland mitigation site should it be needed for groundwater recharge to

[1] The advanced treatment for effluent from STPs 1 and 2 is secondary treatment plus removal of particulate matter and chlorination, without nutrient removal.

enhance wetland revegetation efforts. Design and construction of Phase 2 of Alternative 2 would take approximately 15 months, with the system being operational in the year 2000.

Alternative 3: Tertiary Treated Effluent Blended with Secondary Effluent for Groundwater Recharge at Ysidora Flats

With implementation of Alternative 3, a tertiary treatment[2] facility would be constructed at STP 13. The treated effluent from STP 13 (2.0 MGD) would be pumped to the Ysidora Flats area, and combined with the remainder of secondary effluent from STPs 1 and 2 (0.9 MGD), after irrigation of the Marine Memorial Golf Course, plus the secondary effluent from STPs 3 an 8 (0.7 MGD). The blended effluent from all five STPs (3.6 MGD) would be discharged into the Santa Margarita River at Ysidora Flats. The Lemon Grove ponds, which were previously constructed per the FEIS/R ROD, would be used for storing excess tertiary treated effluent from STP 13. Design and construction of Alternative 3 would take approximately 24 months. Therefore, this alternative would not achieve compliance with the RWQCB Cease and Desist Orders' deadline of May, 1999. Also, the tertiary treatment of effluent from STP 13 could not be accomplished within the funding limits authorized by Congress for this project. Therefore, this alternative would require additional Congressional funding. This alternative would be operational in the year 2004.

Alternative 4: Advanced Wastewater Treatment and Discharge in Cased Wells at Lemon Grove

With implementation of Alternative 4, effluent from STPs 1 and 2 would be used to irrigate the Marine Memorial Golf Course, with the unused portion conveyed to STP 13 for advanced wastewater treatment[3] and then to the previously constructed Lemon Grove ponds. The total effluent from STPs 3, 8, and 13 (3.6 MGD) would be conveyed to STP 13 for advanced wastewater treatment[3], and then to the previously constructed Lemon Grove ponds for disposal. The treated effluent would be conveyed to the water table through cased, gravity injection wells in the Lemon Grove ponds. Design and construction of Alternative 4 would take approximately 18 months, with the system being operational in the year 2000. Therefore, this alternative would not achieve compliance with the RWQCB's May, 1999 deadline of the Board's Cease and Desist Orders.

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[2] The tertiary treatment for STP 13 would include filtration, nutrient removal, and chlorination. Nitrogen and phosphorous would be reduced by biological processes.

[3] See footnote 1.

Alternative 5: Advanced Wastewater Treatment with Irrigation of Agricultural Fields and Discharge in Cased Wells

With implementation of Alternative 5, a system for advanced wastewater treatment[4] would be constructed at STP 13. The effluent from STPs 1 and 2 (0.9 MGD) would be used to irrigate the Marine Memorial Golf Course, with the unused portion conveyed to STP 13 for treatment. The total effluent from STPs 3, 8, and 13, (2.7 MGD) would be conveyed to STP 13 for treatment. The total treated effluent would be conveyed to on-Base agricultural fields for crop irrigation. The agricultural fields are currently being irrigated with potable water. Cased wells would be constructed in the Lemon Grove ponds for discharge of advanced treated effluent in excess of irrigation needs. Design and construction of Alternative 5 would take approximately 24 months, with the system being operational after year 2000. Consequently, this alternative would not achieve compliance with the RWQCB's May, 1999 deadline of the Board's Cease and Desist Orders.

PILOT FIELD STUDY

A pilot field study was conducted by Group Delta Consultants (Group Delta 1998b) during the summer and fall of 1998, to provide recommendations for percolation basin construction. The study included construction at the Lemon Grove site of one 10,000 square foot percolation test basin and two 2,500 square foot basins with vertical drains. Testing, monitoring, and modeling was then conducted to evaluate soil permeability, the potential for "daylighting" of effluent (i.e., emerging from the face of the bluff) or for surfacing of groundwater in the Santa Margarita River floodplain and its estuary due to the additional quantity of groundwater flow from the percolation basins. This study has resulted in the refinement of the design of the Lemon Grove ponds, specifically in the vertical drains which are now proposed to be cased to an elevation of 0 to +2 feet mean sea level (MSL) and extended to a depth of elevation -25 feet MSL. The number of vertical drains would also be reduced from 880 stated in the Draft SEIS to approximately 84 (i.e., 21 in each of the four basins). The results of this study are included in Section 4.1 of this FSEIS.

SUMMARY OF ADVERSE IMPACTS AND MITIGATION MEASURES CONSIDERED

For each of the five alternatives and the No Action Alternative, potential environmental impacts to the following resources are evaluated in this FSEIS: Hydrology and Water Quality, Cultural Resources, Biological Resources, Public Health and Safety, Socioeconomics, Environmental Justice/Protection of

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[4] See footnote 1

Children, Geology and Soils, Air Quality, Land Use, Noise, Transportation and Vehicular Circulation, Visual Resources, and Utilities.

Table S-2, beginning on page S-9, provides a summary of the potentially significant environmental impacts and associated mitigation measures by resource area for each of the alternatives. A detailed discussion of the environmental impacts and associated mitigation measures is provided in Chapter 4.0 of this FSEIS.

FEDERAL, STATE, AND LOCAL AGENCIES FROM WHOM COMMENTS WERE REQUESTED

Comments on the Draft SEIS were requested from the following federal, state, and local agencies, Native American groups, and members of the public:

- U.S. Army Corps of Engineers
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- California Water Resources Control Board
- California Coastal Commission
- California Department of Fish and Game
- California Department of Health Services
- California Department of Transportation
- California Department of Parks and Recreation
- California State Historic Preservation Office
- California Office of Planning and Research
- County of San Diego Department of Environmental Health
- County of San Diego Department of Planning and Land Use
- San Diego Air Pollution Control District
- San Diego Association of Governments
- San Diego Gas & Electric Company
- San Diego Regional Water Quality Control Board

The Draft SEIS was made available for public review and comment from September 11, 1998 to October 26, 1998, with comments sent to:

Southwest Division, Naval Facilities Engineering Command
Attn: Ms. Vicky Taylor, Code 533.VT
1220 Pacific Highway
San Diego, CA 92132-5190

A total of 5 documents were received and each was assessed and considered in preparation the FSEIS. A copy of each letter and the response are contained in Chapter 8.0 of this FSEIS. Where the public comments led to a change in any of the alternatives including the proposed action, or to any other change from the SEIS, the text of this FSEIS incorporates this change.

Table S-2
Summary of Impacts and Mitigation Measures

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	No Action
Hydrology and Water Quality					
Significant Impacts: Potential significant impacts to water quality from effluent discharges to groundwater in the Lemon Grove area were identified.	Significant Impacts: Potential significant impacts to water quality from effluent discharges to groundwater in the Lemon Grove area were identified.	Significant Impacts: Potential significant impacts to surface and ground water from effluent discharges in the Ysidora Flats area. Potential significant impacts from loss of discharge system in flood plain.	Significant Impacts: No significant impacts to hydrology or water quality were identified.	Significant Impacts: No significant impacts to hydrology or water quality were identified.	Significant Impacts: The discharge of secondary effluent at Lemon Grove would not comply with the Cease and Desist Order, would have water quality impacts at the estuary, and would be a significant adverse impact.
Mitigation Measures: A monitoring plan for compliance with Basin Plan Mineral Objectives and for nitrogen and phosphorous in the salt water marsh and estuary would be implemented.	Mitigation Measures: A monitoring plan for compliance with Basin Plan Mineral Objectives and for nitrogen and phosphorous in the salt water marsh and estuary would be implemented.	Mitigation Measures: The discharge of tertiary treated effluent to the Santa Margarita River at Ysidora Flats shall be designed and implemented as prescribed in a NPDES permit. MCB Camp Pendleton to provide spare parts for the discharge system to enable damaged system to be replaced within 30 days of the loss of the system.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: Implement Alternative 1, 2, 3, 4 or 5, or a combination thereof.
Cultural Resources					
Significant Impacts: No significant impacts to cultural resources were identified.	Significant Impacts: No significant impacts to cultural resources were identified.	Significant Impacts: Potential cultural resources impacts along the pipeline route from STP 13 to Ysidora Flats.	Significant Impacts: No significant impacts to cultural resources were identified.	Significant Impacts: Potential cultural resources impacts along the pipeline route from the AWT area to the irrigation reservoirs.	Significant Impacts: No significant impacts to cultural resources were identified.
Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: A cultural resources testing and monitoring program would be conducted prior to the installation of pipeline along the corridor from STP 13 to Ysidora Flats.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: An archaeological monitor and construction monitoring plan would be provided.	Mitigation Measures: No mitigation would be required.

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	No Action
Biological Resources					
Significant Impacts: No significant impacts to biological resources were identified.	Significant Impacts: No significant impacts to biological resources were identified.	Significant Impacts: Potential short-term construction noise impacts. Increased nutrient loading could impact BRAC/Levee mitigation area at Ysidora Flats. Effluent discharge could scour existing mitigation site and replace emerging riparian wetland with freshwater marsh.	Significant Impacts: No significant impacts to biological resources were identified.	Significant Impacts: No significant impacts to biological resources were identified.	Significant Impacts: The discharge of secondary effluent at Lemon Grove would not comply with the Cease and Desist Order, would have water quality impacts at the estuary, and there would be a significant adverse impact.
Mitigation Measures: Best Management Practices (BMPs) to be applied to construction activities.	Mitigation Measures: BMPs to be applied to construction activities.	Mitigation Measures: BMPs to be applied to construction activities. The effluent discharge shall be designed and implemented as allowed in an appropriate NPDES Permit. A monitoring plan would be implemented. Discharge would be designed and monitored in accordance with the Biological Opinion for Programmatic Activities in Riparian and Estuarine/ Beach Ecosystems on Camp Pendleton (USFWS 1995a).	Mitigation Measures: BMPs to be applied to construction activities.	Mitigation Measures: BMPs to be applied to construction activities.	Mitigation Measures: Implement Alternative 1, 2, 3, 4 or 5, or a combination thereof.

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	No Action
Public Health and Safety					
Significant Impacts: Significant short-term construction hazards were identified in FEIS/R.	Significant Impacts: Significant short-term construction hazards were identified in FEIS/R.	Significant Impacts: Significant short-term construction hazards were identified in FEIS/R.	Significant Impacts: Significant short-term construction hazards and equalization pond safety hazard.	Significant Impacts: Significant short-term construction hazards and equalization pond safety hazard. Hazards related to the potential human consumption of reclaimed water.	Significant Impacts: Potential impact of secondary effluent discharge upstream of potable water wells.
Mitigation Measures: Safety fencing and BMPs would be implemented per FEIS/R.	Mitigation Measures: Safety fencing and BMPs would be implemented per FEIS/R.	Mitigation Measures: Safety fencing and BMPs would be implemented per FEIS/R.	Mitigation Measures: Safety fencing and BMPs plus permanent fencing at equalization ponds.	Mitigation Measures: Safety fencing and BMPs plus permanent fencing at equalization ponds. Post multi-lingual signs, implement public relations program.	Mitigation Measures: Safety fencing and BMPs would be implemented per FEIS/R.
Socioeconomics					
Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.
Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.
Environmental Justice/ Protection of Children					
Significant Impacts: Construction impacts are the same as identified for Public Health and Safety.	Significant Impacts: Construction impacts are the same as identified for Public Health and Safety.	Significant Impacts: Construction impacts are the same as identified for Public Health and Safety.	Significant Impacts: Construction impacts are the same as identified for Public Health and Safety.	Significant Impacts: Construction impacts are the same as identified for Public Health and Safety.	Significant Impacts: No significant impacts were identified.
Mitigation Measures: BMPs as required for mitigation of Public Health and Safety impacts.	Mitigation Measures: BMPs as required for mitigation of Public Health and Safety impacts.	Mitigation Measures: BMPs as required for mitigation of Public Health and Safety impacts.	Mitigation Measures: BMPs as required for mitigation of Public Health and Safety impacts.	Mitigation Measures: BMPs as required for mitigation of Public Health and Safety impacts.	Mitigation Measures: No mitigation would be required.

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	No Action
Geology and Soils					
Significant Impacts: Potential significant impacts regarding paleontological resources, as some project features may be underlain by sandstone and claystone sedimentary formations which possess a moderate to high paleontological resource sensitivity.	Significant Impacts: Potential significant impacts regarding paleontological resources, as some project features may be underlain by sandstone and claystone sedimentary formations which possess a moderate to high paleontological resource sensitivity.	Significant Impacts: Potential significant impacts regarding paleontological resources, as some project features may be underlain by sandstone and claystone sedimentary formations which possess a moderate to high paleontological resource sensitivity.	Significant Impacts: Potential significant impacts regarding paleontological resources, as some project features may be underlain by sandstone and claystone sedimentary formations which possess a moderate to high paleontological resource sensitivity.	Significant Impacts: Potential significant impacts regarding paleontological resources, as some project features may be underlain by sandstone and claystone sedimentary formations which possess a moderate to high paleontological resource sensitivity.	Significant Impacts: No impacts would occur.
Mitigation Measures: Presence of environmental monitors during construction.	Mitigation Measures: Presence of environmental monitors during construction.	Mitigation Measures: Presence of environmental monitors during construction.	Mitigation Measures: Presence of environmental monitors during construction.	Mitigation Measures: Presence of environmental monitors during construction.	Mitigation Measures: None required.
Air Quality					
Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.
Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.
Land Use					
Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.
Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.
Noise					
Significant Impacts: No significant impacts to humans were identified. Potential noise impacts to sensitive wildlife species.	Significant Impacts: No significant impacts to humans were identified. Potential noise impacts to sensitive wildlife species.	Significant Impacts: No significant impacts to humans were identified. Potential noise impacts to sensitive wildlife species.	Significant Impacts: No significant impacts to humans were identified. Potential noise impacts to sensitive wildlife species.	Significant Impacts: No significant impacts to humans were identified. Potential noise impacts to sensitive wildlife species.	Significant Impacts: No impacts would occur.
Mitigation Measures: Construction schedule limitations as specified for biological resources.	Mitigation Measures: Construction schedule limitations as specified for biological resources.	Mitigation Measures: Construction schedule limitations as specified for biological resources.	Mitigation Measures: Construction schedule limitations as specified for biological resources.	Mitigation Measures: Construction schedule limitations as specified for biological resources.	Mitigation Measures: None required.

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	No Action
Transportation and Vehicular Circulation					
Significant Impacts: Impacts would be limited to traffic disturbances during construction.	Significant Impacts: Impacts would be limited to traffic disturbances during construction.	Significant Impacts: Impacts would be limited to traffic disturbances during construction, including some construction in or adjacent to roadways.	Significant Impacts: Impacts would be limited to traffic disturbances during construction.	Significant Impacts: Impacts would be limited to traffic disturbances during construction, including some construction in or adjacent to roadways.	Significant Impacts: No significant impacts were identified.
Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: Implement the traffic control plan identified in the FEIS/R to maintain access for vehicles and pedestrians.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: Implement the traffic control plan identified in the FEIS/R to maintain access for vehicles and pedestrians.	Mitigation Measures: No mitigation would be required.
Visual Resources					
Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.
Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.
Utilities					
Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.	Significant Impacts: No significant impacts were identified.
Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.	Mitigation Measures: No mitigation would be required.

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CHAPTER 1.0
PURPOSE AND NEED

1.0 PURPOSE AND NEED

This Final Supplemental Environmental Impact Statement (FSEIS) was prepared in compliance with the following laws, regulations of guidelines:

- National Environmental Policy Act (NEPA) of 1969, as amended, 42 U.S.C. 4321;
- Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 C.F.R. §§1500-1508);
- Marine Corps Order (MCO P5090.2), which establishes procedures for implementing NEPA; and
- Resource-specific regulatory guidelines presented in Appendix A of the original Final Environmental Impact Statement/Environmental Impact Report (FEIS/R) for this project.

NEPA requires consideration of environmental concerns in the decision-making process for major federal actions. CEQ regulations implement the "action forcing" provision of NEPA to ensure that federal agencies comply with the letter and spirit of the Act. MCO P5090.2 provides specific guidance for the United States Marine Corps in preparing environmental documentation for Marine Corps actions subject to NEPA.

This FSEIS is a supplement to the *Final Environmental Impact Statement/Report, Sewage Effluent Compliance Project, Lower Santa Margarita Basin, Marine Corps Base Camp Pendleton, San Diego County, California, April 1997*, hereafter referred to as the FEIS/R. The FEIS/R included analysis in accordance with the California Environmental Quality Act (CEQA) for those portions of the proposed action that were to be located in the City of Oceanside, including disposal of secondarily treated effluent in the City's own outfall. The Oceanside City Council rejected implementation of the proposed project in the City. The revised proposed action would be located entirely within Marine Corps Base (MCB) Camp Pendleton. Therefore, a Supplemental Environmental Impact Report (SEIR) is not required, and the revised proposed action does not require any local approvals or certification in accordance with CEQA. Thus, only an FSEIS, not an FSEIR, has been prepared for the current proposed action.

1.1 PURPOSE AND NEED

The purpose of and need for the proposed action is to ensure that disposal of sewage effluent from Sewage Treatment Plants (STPs) 1, 2, 3, 8, and 13 in the Lower Santa Margarita Basin at MCB Camp Pendleton satisfies the following:

(1) the Cease and Desist Orders and National Pollution Discharge Elimination System (NPDES) Permit (Order No. 94-51) issued by the San Diego Regional Water Quality Control Board (RWQCB), thereby meeting water quality standards contained in the 1975 Water Quality Control Plan for the San Diego Basin (Basin Plan), or an approved modification thereto;

(2) statutory and regulatory requirements administered by agencies having jurisdiction over the Lower Santa Margarita Basin; and,

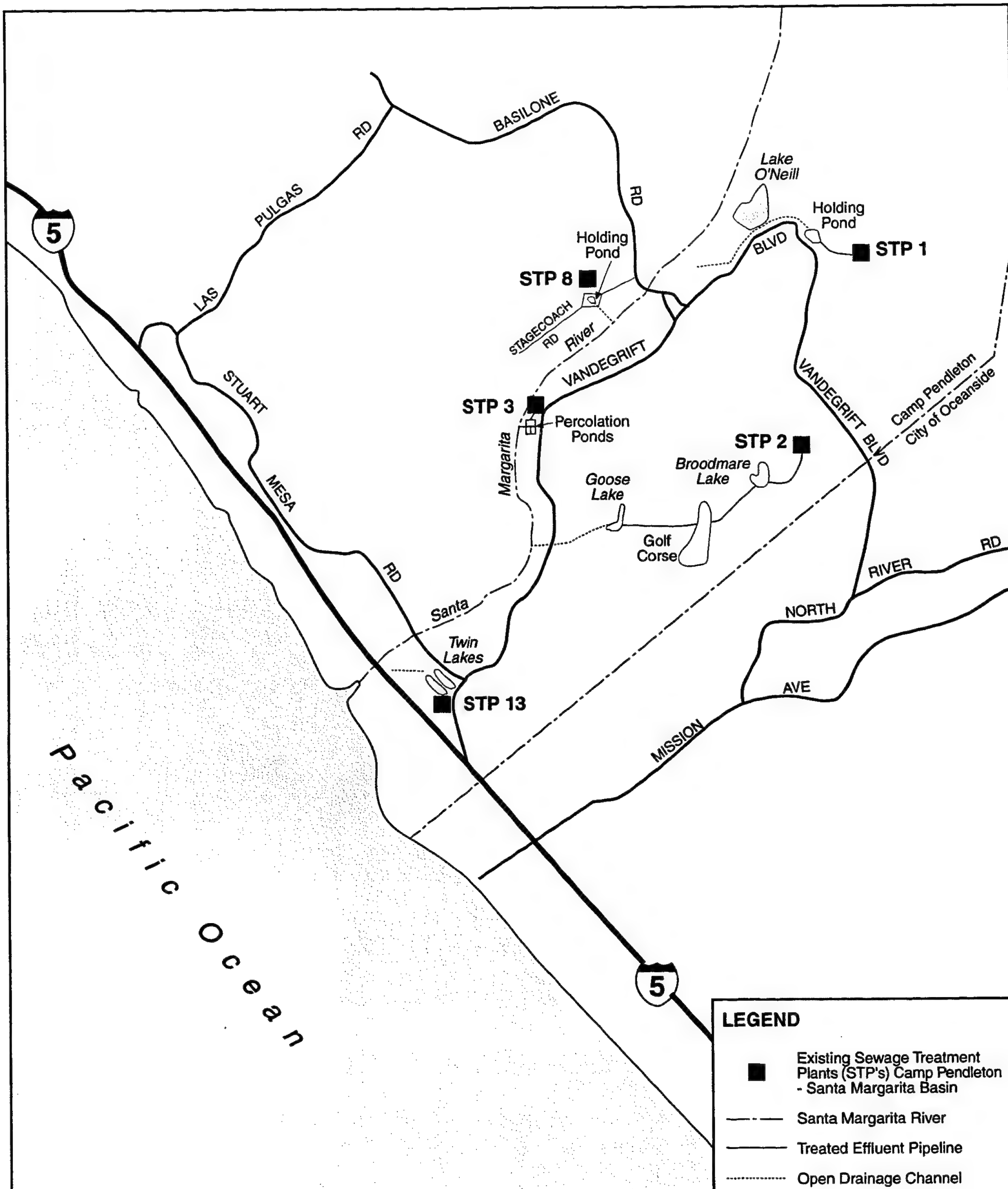
(3) Base mission requirements.

1.1.1 Project Background

Basewide, MCB Camp Pendleton currently collects, provides secondary treatment for, and disposes of treated wastewater through a system of nine STPs (Figure 1-1). STPs 1, 2, 3, 8, and 13 and associated facilities within the Lower Santa Margarita Basin[1] were constructed prior to 1960, which was prior to the enactment of the Clean Water Act of 1977 and the water quality standards established in the 1975 Basin Plan. The purpose of these water quality standards is to maintain water quality consistent with the beneficial uses of the Basin. Beneficial uses of water resources within the Basin include, but are not limited to, domestic, municipal, agricultural, and industrial supply; groundwater recharge; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and, other aquatic resources or preserves.

The sewage effluent discharged from STPs 1, 2, 3, 8, and 13 into the Santa Margarita River and flood plain is currently not in compliance with the water quality standards set forth in the current or any prior version of the Basin Plan (RWQCB 1994), and is in violation of the Waste Discharge Requirements (NPDES permits) issued by the RWQCB. RWQCB adopted waste discharge requirements/permits for STPs 1, 2, 3, 8, and 13 in May 1987 and all five permits were combined into one (Permit No. CA0108863, Order No. 94-51). The RWQCB Cease and Desist Orders were amended in 1991, 1994, and 1996, to set new milestone dates and interim effluent limits until compliance could be achieved. Table 1-1 shows the water quality standards or limitations for each constituent, as identified in the NPDES Permit No. 94-51 for STPs 1, 2, 3, 8, and 13.

[1] STPs 1 and 2 are located in the San Luis Rey Basin, although they treat water supplied from the Lower Santa Margarita Basin and the effluent discharge point of STP 1 is in the Santa Margarita Basin. STP 2 effluent is used primarily to irrigate the Marine Memorial Golf Course, in the San Luis Rey Hydrologic Unit, as permitted under RWQCB Order No. 94-72. When not used on the golf course, effluent from STP 2 is discharged to the Santa Margarita Hydrologic Unit.



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No Scale

Figure 1-1

Existing Facilities and Discharge Points

Table 1-1
Effluent Limit for STPs 1, 2, 3, 8, and 13

Constituent	Units	30-Day Average	7-Day Average	Daily Maximum
Biochemical Oxygen Demand (BOD @ 20°C)	mg/L lbs/day	30 1,654	45 2,481	45 2,481
Total Suspended Solids	mg/L lbs/day	30 1,654	45 2,481	45 2,481
pH	pH units	Within the limits of 6.5 to 8.5 at all times		
Total Dissolved Solids (TDS)	mg/L lbs/day	750 41,345		850 46,858
Chloride	mg/L lbs/day	300 16,538		350 19,295
Percent Sodium	%	60		65
Sulfate	mg/L lbs/day	300 16,538		350 19,295
Total Nitrogen	mg/L lbs/day	1.0 55.1		2.0 110.2
Total Phosphorus	mg/L lbs/day	0.1 5.5		0.2 11.0
Iron	mg/L lbs/day	0.3 16.5		0.4 22.1
Manganese	mg/L lbs/day	0.05 2.76		0.06 3.31
Methylene Blue Active Substances	mg/L lbs/day	0.5 27.6		0.6 33.1
Boron	mg/L lbs/day	0.5 27.6		0.6 33.1
Turbidity	NTU	20		25
Color	Units	20		25
Fluoride	mg/L lbs/day	1.0 55.1		1.2 66.1
Fecal Coliform	MPN/100ml	200		400
Total Chlorine Residual	mg/L lbs/day	0.01 0.55		0.02 1.10
Dissolved Oxygen	mg/L	Not less than 5.0 at any time		
Acute Toxicity	TUa	No acute toxicity shall occur in undiluted effluent		
Chronic Toxicity	TUc			1.0

Source: RWQCB NPDES Permit No. 94-51
mg/L = milligrams per liter; lbs/day = pounds per day; NTU = turbidity units; MPN = most probable number; TUa = acute toxicity units; TUc = chronic toxicity units

The majority of the constituents that have historically been in violation of the NPDES Permit have been brought into compliance by MCB Camp Pendleton through improved operation, minor plant modifications, and improved monitoring capabilities. However, compliance with the limitations for total dissolved solids (TDS), nitrogen, phosphorus, iron, and manganese cannot be achieved at the existing sewage treatment plants, because they were not designed for removal of these constituents. Therefore, compliance with the Cease and Desist Orders would require the modification of existing facilities or the construction of new facilities.

In addition to satisfying the Cease and Desist Orders, the proposed action must comply with applicable rules and regulations promulgated by federal agencies, including the U.S. Environmental Protection Agency (USEPA), U.S. Fish and Wildlife Service (USFWS), and the U.S. Army Corps of Engineers (USACOE), as well as regional and state entities such as the RWQCB, State Water Resources Board, and California Department of Health Services (DHS). A discussion of the regulatory authority with which the proposed action must comply is presented in Section 1.2.

MCB Camp Pendleton recognizes the value of developing long-term improvements to water quality and quantity on Base. Accordingly, MCB Camp Pendleton intends to submit a request to Congress for funding of tertiary treatment of all effluent on the Base.

1.1.2 The FEIS/R

A FEIS/R was prepared for the originally proposed project which included a system of pumps and piping that would deliver effluent from STPs 1, 2, 3, 8, and 13 to equalization/holding ponds and, ultimately, discharge at an existing ocean outfall owned by the City of Oceanside. Three alternatives were evaluated in the FEIS/R, each including an element of effluent or brine discharge through the ocean outfall. During final consideration of the proposed action, use of the ocean outfall was not approved by the City of Oceanside City Council. Consequently, MCB Camp Pendleton is proceeding with on-Base construction of the effluent collection and percolation pond elements of the disposal system described in the FEIS/R and Record of Decision (ROD). This FSEIS analyzes alternative ways to provide sufficient disposal capacity on-Base without the use of Oceanside ocean outfall, and thus achieve compliance with the RWQCB Cease and Desist Orders.

1.2 REGULATORY AUTHORITY

1.2.1 Water Quality Regulations

Federal laws for control of water quality have been enacted to establish the requirements for adequate planning, implementation, management, and enforcement, including penalties for non-compliance. In addition, federal and state regulations and plans have been developed to augment and clarify the laws and to provide details not included in the law.

Major federal and state laws regulating water quality on MCB Camp Pendleton are as follows:

- Federal Clean Water Act of 1977 (33 U.S.C. § 1251);
- Federal Safe Drinking Water Quality Act of 1974, as amended (42 U.S.C. § 300f);
- State of California Porter-Cologne Water Quality Act (Cal. Water code §§ 13000-13999.10);
- California Safe Drinking Water and Toxic Enforcement Act (1986); and
- Coastal Zone Management Act (16 C.F.R. § 1451)

These laws are described in the FEIS/R, Appendix A.

1.2.2 Regulatory Agencies

U.S. Environmental Protection Agency

Congress has identified USEPA as the administrator for water pollution prevention, as identified in the Clean Water Act. Under the Clean Water Act, federal agencies must cooperate with state and local agencies to develop comprehensive solutions to prevent, reduce, and eliminate pollution. Both USEPA and RWQCB regulate water quality issues on MCB Camp Pendleton. USEPA also establishes and upgrades federal drinking water quality standards in accordance with the Federal Safe Drinking Water Quality Act of 1974 (as amended).

U.S. Fish and Wildlife Service

The USFWS administers the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531) (ESA). Where federal projects may impact listed or proposed threatened or endangered species, consultation with USFWS is required under Section 7 of the ESA. To quantify impacts to listed species, federal agencies prepare biological assessments (BA). The USFWS renders a biological opinion (BO), as to whether the proposed project will jeopardize the continued existence of the listed

species or not. The USFWS may also provide input relative to the Clean Water Act, and other issues where federal permits are required.

U.S. Army Corps of Engineers

The USACOE is the permitting agency for actions which may impact jurisdictional wetlands and "waters of the United States" as defined by Section 404 of the Clean Water Act (33 U.S.C. § 1344). Certain minor actions that fill jurisdictional wetlands or waters of the U.S. may proceed under the rules for general "nationwide" permits. Otherwise, a specific, individual permit is required before an action may proceed.

San Diego Regional Water Quality Control Board

The RWQCB regulates all discharges of wastewater to groundwater or surface waters through the issuance of discharge permits, enforcement orders, cleanup orders, and fines for non-compliance. Specifically, the RWQCB issues Waste Discharge Requirement permits and NPDES permits for discharge of treated wastewater into the ocean or inland surface waters or on land. Waste disposal requirements are established by the RWQCB for any entity discharging wastes into waters in the San Diego Basin, including MCB Camp Pendleton.

California Department of Health Services

Within the State of California, the DHS has established drinking water standards that are at least as stringent as the federal standards. The DHS is the responsible agency that determines whether a water source influenced by effluent may be used as a potable water source. The DHS protects groundwater sources or potable water supplies through a series of guidelines which address treatment and recharge methods, the proximity of wells, and the aquifer characteristics.

San Diego County Department of Environmental Health

The San Diego County Department of Environmental Health (DEH) administers health functions as delegated by DHS. These functions include, but are not limited to, recycled water programs and potable water well permitting.

California Coastal Commission

The California Coastal Commission's duties include the issuance of development permits in coastal areas, the encouragement of coastal access, regulation of port expansion, protection of coastal wetlands, and the prevention of offshore spills.

1.3 REQUIREMENTS OF THE PROPOSED ACTION

As discussed above, the purpose of and need for the proposed action is to satisfy both the Cease and Desist Orders and the statutes and regulations administered by the governing federal and state agencies, as well as maintain the Base mission. The goal of the proposed action would be to meet requirements and provide benefits as follows:

- comply with the May 1999 deadline for compliance with the RWQCB Cease and Desist Orders;
- comply with water quality standards including safe drinking water standards as identified in applicable federal and state statutes and regulations;
- comply with Section 404 of the Clean Water Act, in accordance with USACOE permitting procedures;
- comply with the Endangered Species Act, in accordance with USFWS requirements;
- maintain beneficial uses of the groundwater basins by preventing degradation of water quality;
- sustain the volume of groundwater in the Lower Santa Margarita Basin; and
- minimize salt water intrusion from the Pacific Ocean into the Lower Santa Margarita Basin.

1.4 PROJECT LOCATION

The proposed action is located wholly within MCB Camp Pendleton, which is located in the northwestern part of San Diego County, California. MCB Camp Pendleton is the Marine Corps amphibious training center for the west coast, and is comprised of a 200-square-mile area, with Orange County to the northwest, and Riverside County to the north and east. The Base is located 40 miles north of downtown San Diego and is bordered by the City of San Clemente to the north, the community of Fallbrook and the Cleveland National Forest to the east, and the City of Oceanside to the south. MCB Camp Pendleton's western-most boundary fronts approximately 18 miles of beaches and coastal bluffs. Regional access from the north and south is provided by Interstate 5 (I-5); eastern inland access is provided by Interstate 15 (I-15), and State Route 76 (SR-76) (Figures 1-2 and 1-3). The locations of specific components of the proposed action are described in Section 2 of this FSEIS.

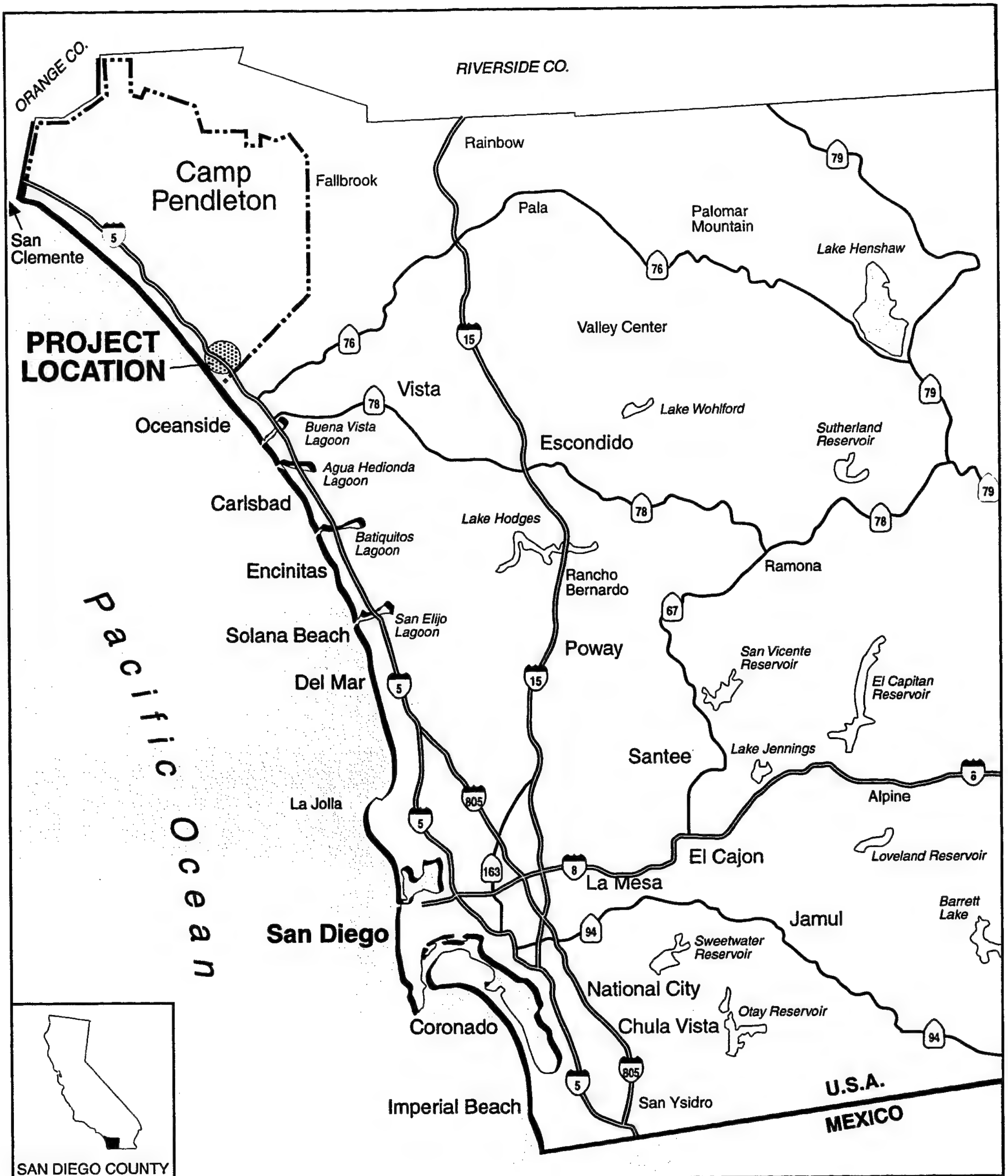

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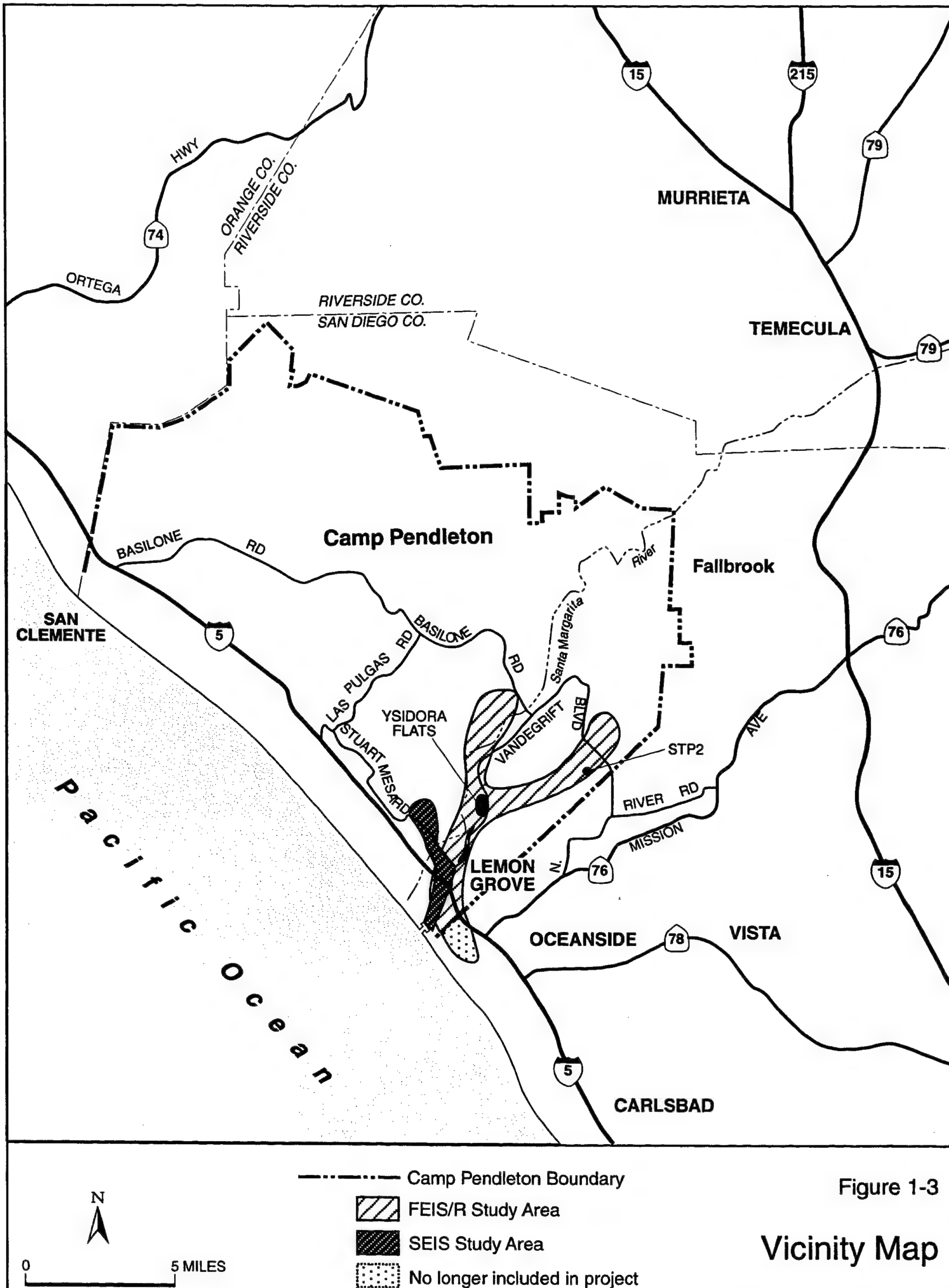
Figure 1-2

Regional Location Map

No Scale



Camp Pendleton Boundary

FEIS/R Study Area

SEIS Study Area

No longer included in project

Figure 1-3

Vicinity Map

9416 P-527/Figures/Figure 1-2 Vicinity Map

1.5 MISSION OF MCB CAMP PENDLETON

MCB Camp Pendleton has a large land area that provides an extensive sea-land connection. The Base encompasses a wide variety of terrain, coast line with inland maneuver area, and restricted airspace overhead provides a unique opportunity for amphibious landings, attacking sea to land, and a full spectrum of training environments for the Marine Corps. The mild climate provides a year-round training base, making MCB Camp Pendleton a unique and valuable defense installation.

The types of training occurring at MCB Camp Pendleton include: over-the-ground maneuvers; tank and antitank maneuvers; weapons firing; aerial weapons delivery; organization of supply, fuel, and communication systems; airlifting of troops and supplies; reconnaissance; loading and unloading of ships and aircraft; tracked vehicle operation and maintenance; and field medical treatment.

1.6 SCOPING PROCESS

1.6.1 Issue Identification

CEQ (40 C.F.R. § 1502.9) and MCO P5090.2 require preparation of a SEIS if substantial changes are made in the proposed action that are relevant to environmental concerns. As defined in CEQ regulations, an EIS is a concise public document specifying anticipated impacts from an action for which a federal agency is responsible. The EIS must provide full and fair discussion of significant environmental impacts, and it must inform decision-makers and the public of reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the human and natural environment. The EIS serves to ensure that the policies and goals defined in NEPA are integrated into the ongoing programs and actions of the federal government. Federal officials are required by NEPA to use the EIS to plan actions and make decisions.

NEPA regulations require an early and open process for determining the scope of issues to be addressed in an EIS. CEQ regulations exempt an SEIS from scoping requirements. CEQ regulation 40 C.F.R. § 1502 states, "... supplements shall be prepared, circulated, and filed in the same fashion as a DEIS or FEIS. However, scoping is not required."

Although scoping is not required for an SEIS, the Marine Corps published a *Notice of Intent to Prepare a Supplemental Environmental Impact Statement for the Sewage Effluent Compliance Project at Marine Corps Base Camp Pendleton, California* on February 4, 1998, and mailed the notice to agencies and other parties on February 12, 1998. The Notice of Intent (NOI) invited agencies, organizations, and the general public to provide written comments relative to the proposed

action and the issues to be addressed in the SEIS. The NOI and comments thereto are included in Appendix A.

The principal issues identified in the scoping of the SEIS related to change or loss of wetland habitat; damage or loss of coastal sage scrub habitat; disturbance or displacement of threatened or endangered species; and visual impacts of proposed percolation ponds.

1.6.2 Contents of this FSEIS

As described in Section 1.1.2 above, MCB Camp Pendleton is proceeding with on-Base construction of the effluent collection and percolation pond elements of the disposal system described in the FEIS/R. This FSEIS analyzes alternative ways to provide additional and sufficient disposal capacity on-Base without the use of the Oceanside ocean outfall and to achieve compliance with the San Diego RWQCB Cease and Desist Orders. All alternatives discussed in this FSEIS assume completion of construction of the pipelines and pump stations required to convey the secondary effluent from STPs 1, 2, 3, 8, and 13 to the 22-acre Lemon Grove Ponds, as described in the FEIS/R, and approved in the ROD. These project elements were not reanalyzed in this FSEIS. As required by CEQ, 40 C.F.R. § 1502, impacts are discussed in proportion to their significance. The issues addressed in detail in this FSEIS are limited to address changes from those discussed in the FEIS/R; much of the FEIS/R analysis is not repeated in this FSEIS. The FEIS/R is incorporated by reference into this FSEIS.

1.6.3 Use of this FSEIS

The Draft SEIS was provided for review by: (1) the regulatory agencies and interested parties listed in the Summary; (2) those agencies and parties that commented on the NOI for this FSEIS; (3) those agencies and parties that commented on the previous Draft and Final EIS/R; and (4) the general public. The results of this review are provided in Chapter 8.0 of this FSEIS. Comments received were considered in evaluation of the proposed action and alternatives. Data from engineering and biological resource studies, as described in the Summary and Sections 2.2.1, were also reviewed and evaluated. The results of the evaluation was used in preparation of this Final SEIS. The Final SEIS will be utilized by the Marine Corps in preparing a ROD for the proposed action. The ROD will document which alternative was selected by the Marine Corps for compliance with the Cease and Desist Orders together with the reasons for its selection. In addition, the RWQCB will utilize both the FEIS/R and the FSEIS in their review of the project to determine whether the selected alternative complies with the Cease and Desist Orders, whether effluent discharges are consistent with the objectives of the Basin Plan, and in the preparation of appropriate permits.

1.7 PUBLIC COMMENT AND RESPONSES

The public review and comment period for the SEIS began on September 11, 1998, with a Notice of Availability published in the *Federal Register*, and ended on October 26, 1998. During this review period, public comments on the SEIS were solicited. Written comments were submitted to Ms. Vicky Taylor, Southwest Division, Naval Facilities Engineering Command in San Diego, California. A public hearing was also held on October 14, 1998 in Oceanside, California at which the Marine Corps presented the findings of the SEIS and invited public comments. Notification of the public hearing was published in the *San Diego Union-Tribune*, *Californian* (Temecula) and the *North County Times* (San Diego) approximately one month prior to the public hearing. No questions or public comments were received during the public hearing.

During the public comment and review period, written comments on the SEIS were received through the mail or through facsimile from federal, state and local agencies and officials, and from organizations and individuals. A total of 5 documents were received and each was assessed and considered in preparing the FSEIS. Each comment received a response; and a copy of each letter and the response are contained in Chapter 8.0 of this FSEIS. Some issues addressed in the public comments led to further analysis and/or verification of data. Where the public comments led to a change in any of the alternatives including the proposed action, or to any other change from the SEIS, the text of this FSEIS incorporates this change.

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CHAPTER 2.0
ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 BACKGROUND

NEPA requires consideration of alternatives that reasonably achieve the objectives of the purpose and need for the proposed action. As discussed in Section 1, the purpose of and need for the proposed action is to ensure that future disposal of sewage effluent from STPs 1, 2, 3, 8, and 13 in the Lower Santa Margarita Basin at MCB Camp Pendleton satisfies:

(1) the Cease and Desist Orders and National Pollution Discharge Elimination System (NPDES) Permit (Order No. 94-51) issued by the San Diego Regional Water Quality Control Board (RWQCB), thereby meeting water quality standards contained in the 1975 San Diego Water Quality Control Plan (Basin Plan), or an approved modification thereto;

(2) the statutory and regulatory requirements administered by agencies having jurisdictional authority over the Lower Santa Margarita Basin; and,

(3) Base mission requirements.

2.1.1 Selection of Alternatives

On August 26, 1997, the Department of the Navy announced its decision to upgrade the wastewater treatment and disposal systems in the Santa Margarita Basin of MCB Camp Pendleton. This project was initiated in response to a Cease and Desist Order issued to MCB Camp Pendleton by the San Diego RWQCB. Effluent discharged did not meet California State water quality standards. The new facilities to be constructed included a new 22 acre percolation basin in the Lemon Grove area of MCB Camp Pendleton, pumping facilities and pipelines to connect five existing sewage treatment plants (STP). During dry periods, all effluent was to be disposed via the new percolation basin. During wet periods, most of the effluent was to be disposed in the new percolation basin; some flows, though, would be disposed via the City of Oceanside La Salina ocean outfall. On September 3, 1997, the City of Oceanside decided to deny the Marine Corps use of the La Salina ocean outfall. The need for the Lemon Grove percolation basin and connecting pipelines to the STPs still existed. The Department of the Navy commenced with construction activities. Specifically, construction of 82,000 feet of pipeline to connect the five STPs, the pumps stations and the Lemon Grove ponds was initiated. However, a new solution was required for disposal of flows that were to be accommodated

by the La Salina ocean outfall. Accordingly, the Marine Corps began to explore options for disposal of this flow.

Prior to 1997 and in conjunction with the FEIS/R, a variety of sewage effluent disposal alternatives were evaluated to determine whether they could reasonably and feasibly satisfy the stated purpose and need for the proposed action. In the fall of 1997, following the City of Oceanside rejection of the proposal to dispose of MCB Camp Pendleton effluent in the City outfall, additional alternatives were studied. These studies included soils testing to identify potential sites for effluent percolation ponds. With these data, and in consideration of the time constraints of the Cease and Desist Orders, and the time and budgetary constraints of military construction funding, MCB Camp Pendleton completed a separate evaluation and report entitled *Marine Corps Base Camp Pendleton Alternative and Regulatory Analysis for Effluent Discharge* (Montgomery Watson 1998). Based on this alternative analysis, five action alternatives and the No Action Alternative were included for detailed analysis in this FSEIS and are discussed in Section 2.2. Alternatives evaluated and rejected are described in Section 2.3.

All alternatives discussed in this FSEIS assume completion of construction of the pipelines and pump stations required to convey the secondary effluent from STPs 1, 2, 3, 8, and 13 to the 22-acre Lemon Grove Ponds, as described in the FEIS/R, approved in the ROD, and under construction in 1998 (Figure 2-1).

In addition to new alternatives, alternatives that had been considered and rejected for the FEIS/R were reexamined, as well as new locations for effluent percolation ponds. With one exception, alternatives that would result in many years of delay in compliance because of the need for extensive studies and new funding from the Military Construction (MCON) program were eliminated as not meeting the Purpose and Need of the project. Alternative 3, described in Section 2.2.3, was developed in response to comments received from federal and state agencies and private parties who encouraged the upstream reuse of treated effluent as a preferable alternative to discharge near or in the ocean. Upstream reuse is also consistent with the long-term goals of MCB Camp Pendleton. Based upon an analysis of the costs to achieve nutrient removal in conjunction with tertiary treatment of the effluent from STP 13 included in Alternative 3, this alternative cannot be accomplished within the level of funding Congress has authorized to construct this project. This alternative was retained for detailed analysis to further investigate the concept of upstream effluent use and its viability for future implementation. Alternative 2 would be feasible with current funding, and has been designated the Preferred Alternative.

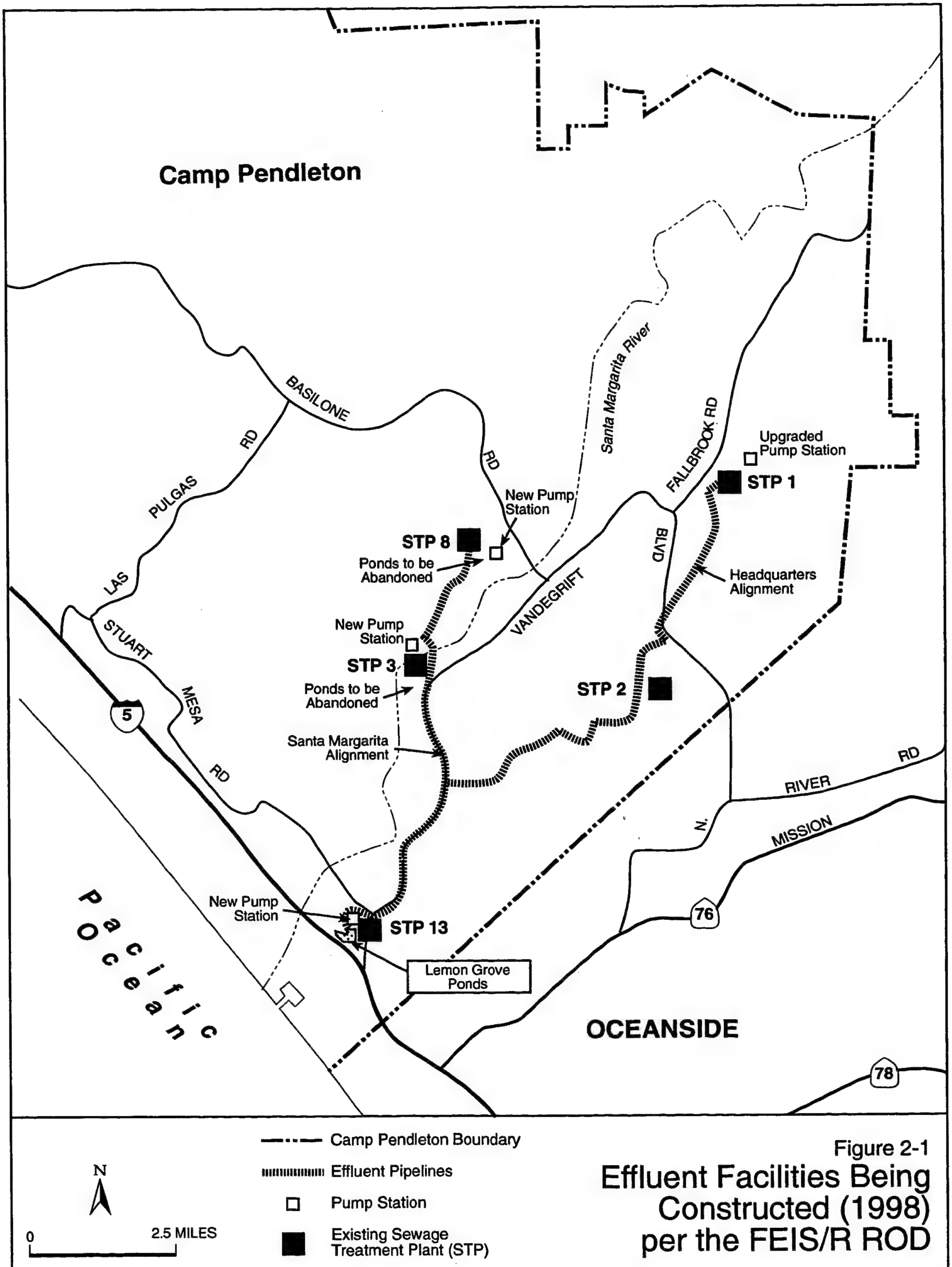


Figure 2-1
Effluent Facilities Being Constructed (1998) per the FEIS/R ROD

9416 P-527/Figures/Figure 2-1 Effluent Facilities

2.1.2 Effluent Flow Projections

The alternatives evaluation included an update of existing and projected effluent volumes (Nolte 1998). Existing flows were revised based on data provided by improved instrumentation. Projected flows consider anticipated growth in Base facilities. The existing and design average daily effluent disposal volumes are shown in Table 2-1. The design flow for the proposed action would be approximately 25 percent over the projected flow. The total design flow of 3.54 million gallons per day (MGD) shown in Table 2-1 is rounded to 3.6 MGD for purposes of further discussion in this FSEIS.

Table 2-1
STP Average Daily Discharge Quantities

	Discharge (MGD)	
STP	**Existing**	**Design**
1	0.42	0.54
2	0.28	0.35
3	0.43	0.55
8	0.09	0.10
13	1.53	2.00
Total	**2.75**	**3.54**

2.1.3 Pilot Field Study and Modeling

A pilot field study was conducted during the summer and fall of 1998. The purposes of the study were to refine estimates of the percolation capacity of the ponds and vertical drains and provide data for companion groundwater modeling studies to examine the potential for lateral groundwater seepage of effluent to surface at the river bluff face, a phenomenon called "daylighting." The data would also be used to predict future water quality and water table elevations for one or more of the alternatives. To assure long term protection of the aquifers in the Lower Santa Margarita Basin and coastal waters, the model was to define the influence and boundary of discharge into the basin. The model would also address potential concentration of nutrients on adjacent water quality.

Three test basins were installed in the Lemon Grove area; two with vertical drains. Instrumentation to measure ground water elevation and soil moisture were installed in the area. Following the data collection, two types of numerical modeling were performed:

- Moisture transport modeling through unsaturated soil was conducted to evaluate the design of the percolation basins and vertical drains, and to minimize the potential for the surfacing of secondary effluent. The HYDRUS-2D (Simunek et al, 1996) model was used. This modeling also predicted groundwater elevations.

- Groundwater flow and solute transport calculations were made to estimate the changes in nutrient concentrations in the groundwater. The MS-VMS (Modflow-Surfact-Visual-Modeling-System) Version 1.2 (HydroGeologic, Inc., 1996) model was used.

The test basin studies, modeling and results are described in detail in *Phase II Report, Percolation Pond Study, FY 1993 MCON Project P-527B*, (Group Delta Consultants 1998b). The principal findings are the following:

Percolation Ponds and Vertical Drains

- Pilot testing confirmed that infiltration rates are insufficient to dispose of the design flows through percolation.

- Pilot testing demonstrated that the use of vertical drains extending to the water table significantly increases infiltration rates, and modeling showed that higher infiltration rates would be achieved by extending the vertical drains to at least ten feet below the existing water table.

- Pilot testing and modeling indicated a design infiltration rate for a single vertical drain of 345,000 gallons per day. Based on the pilot testing and the design flow rate of 3.6 MGD approximately 21 drains would be installed in each of the four proposed ponds, for a total of approximately 84 drains. This would accommodate approximately twice the anticipated 3.6 MGD design flow.

Effluent Surfacing

- Pilot testing and modeling indicated that the potential for effluent surfacing on the slopes of the river bluff would be high if the effluent would be allowed to percolate through the bottoms of the percolation ponds.

- Modeling indicated that the potential for effluent surfacing on the slopes and bluff would decrease as the depth of the vertical drain below the water table increases. This assumes that the source of effluent would be the vertical drain, and not the percolation ponds.

- Modeling indicated that casing the vertical drains from the bottom of the ponds to a depth of approximately four feet below the water table (0 - 2 feet above mean sea level) would further reduce the potential for surfacing of effluent.

Groundwater Flow

- Modeling indicated that near the disposal basins, the effluent would mix with the groundwater and flow predominantly toward the southwest and under Camp Del Mar within high conductivity terrace soils. Flow to the west and northwest, towards the estuary and river valley, would be constrained by low permeability river alluvium which is significantly lower in hydraulic conductivity (Figure 2-2).

- The groundwater flow distribution has been estimated at 90 percent beneath Camp Del Mar, and 10 percent beneath the estuary area.

Groundwater Elevation

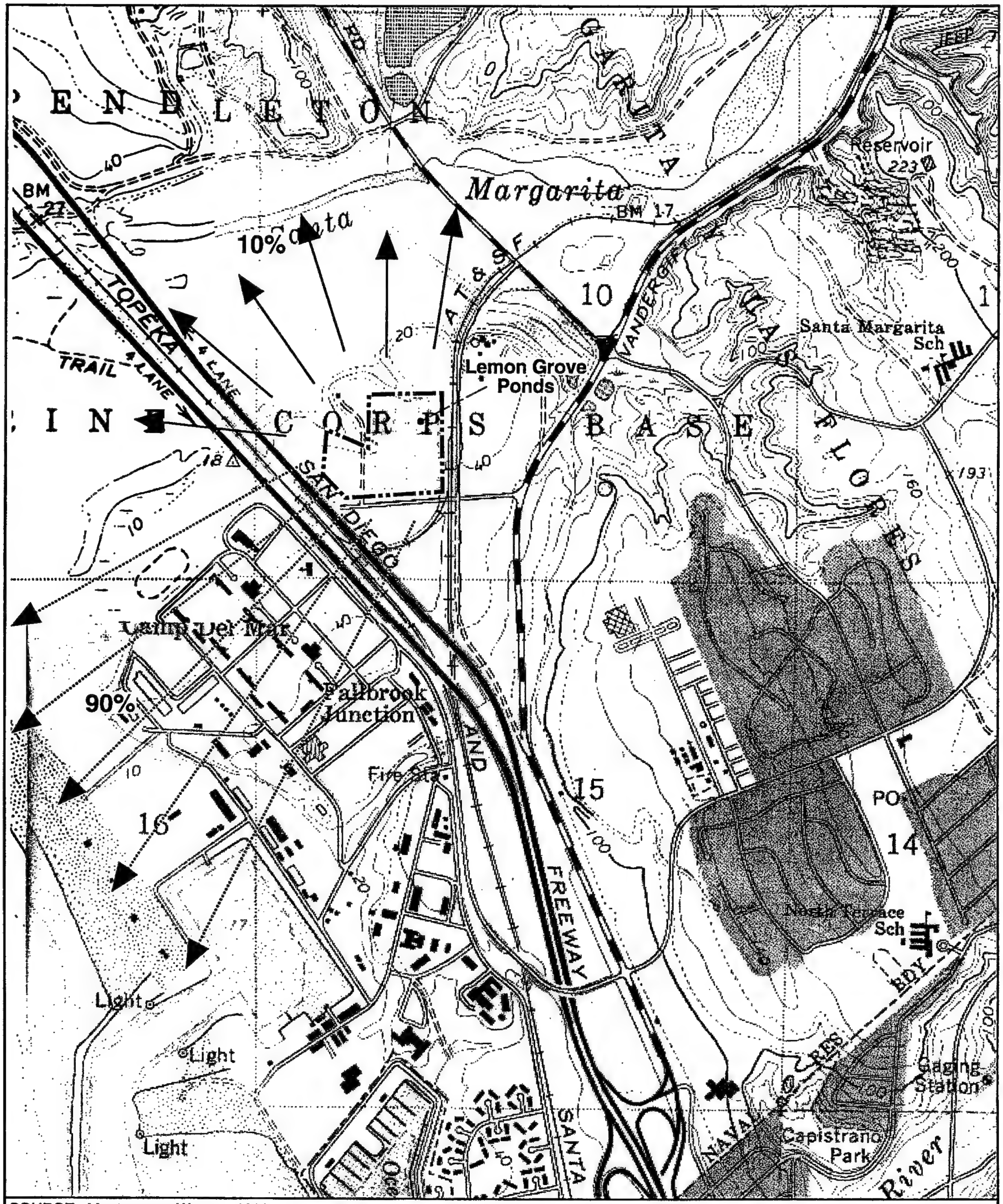
- Existing groundwater elevation in the Lemon Grove area is 5 to 6 feet above mean sea level (MSL). North and northwest of the basin area toward the river, the existing water table is likely to be immediately below land surface in the dry season, and occasionally above the land surface in the wet seasons. West of I-5, in the estuary area, the water table is permanently above the land surface in some locations, as evidenced by the presence of lagoons.

- The analyses indicated that casing the vertical drains would be required to prevent discharge in the unsaturated zone resulting in effluent discharge at the river bluffs (Figure 2-3).

- The analysis indicated the discharge from cased wells into the groundwater would result in a mounding of the groundwater. Thus, groundwater would likely discharge to the surface on the river valley floor north and northwest of the disposal basins. Current groundwater elevations are likely within one to two feet of the land surface at these locations.

Nitrogen Concentrations

- The average existing nitrate concentration in secondary effluent is 21 milligrams per liter (mg/l). Modeling indicated that groundwater dilution of the effluent would reduce nitrogen concentrations in the groundwater-effluent mixture to approximately 1 mg/l (above background) at the points of discharge to the ocean, and less than 1 mg/l at the points of discharge to the river

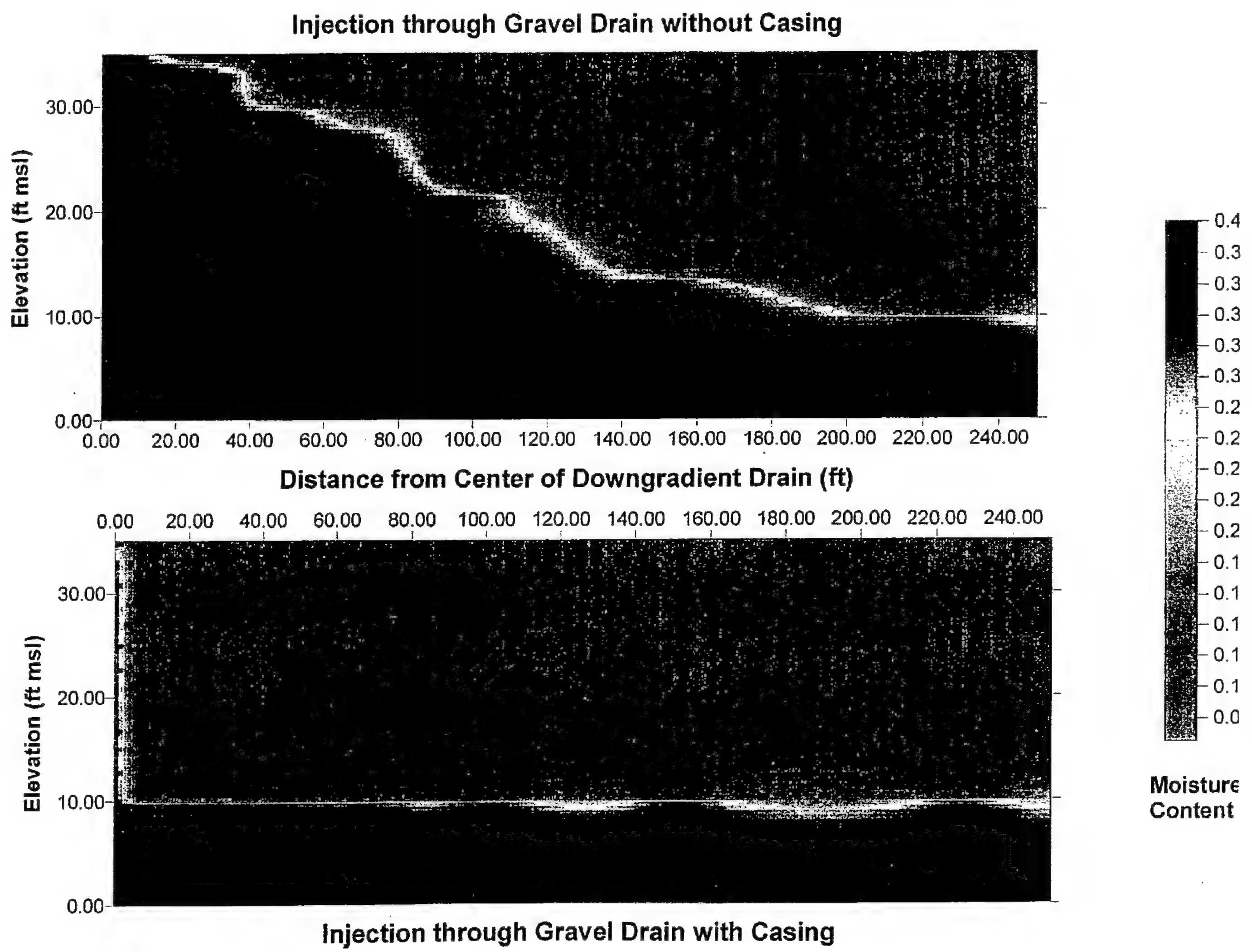


SOURCE: Montgomery Watson, 1998

Figure 2-2

Approximate Distribution of Effluent Groundwater Mix from Cased Vertical Drains

9416 P-527/Figures/Figure 2-2 Approximate



Source: Group Delta 1998, Nolte 1998

Figure 2-3
Cased Vertical Drains-
Predicted Water Table Elevation

area. Therefore, the total nitrogen composition would be significantly reduced from the 21 mg/l currently being discharged into the Santa Margarita River from STP13.

Phosphorous Concentrations

Phosphorous concentrations were not specifically modeled, as the dilution effect would be the same as for nitrogen. Based upon initial model results, total phosphorous concentrations in ground water as a result of effluent discharged to the water table would have a concentration of less than 0.25 mg/l in the vicinity of the river and approximately 0.25 mg/l where it discharges to the ocean. Therefore, the total phosphorous composition would be significantly reduced from the 5.8 mg/l currently being discharged into the Santa Margarita River from STP 13.

Changes in Alternatives from the Draft Supplemental EIS

As a result of the pilot tests and modeling studies, Alternatives 1 and 2, as proposed in the DSEIS, have been modified as follows:

- The depth of the ponds would be excavated one to five feet, to assure that there would be low permeability soil at the bottom of the ponds. This would minimize percolation, thus removing a principal potential path for the daylighting of secondary effluent at the river bluff.

- The bottom of the vertical drains would be at elevation -25 feet MSL (a depth of approximately 60 feet) in order to discharge the effluent directly into the groundwater.

- The vertical drains would be cased from the bottom of the ponds to an elevation of 0-+2 feet MSL. The purposes of casing the drains would be to convey the effluent below the groundwater table, where it would mix with the groundwater. This would prevent the effluent from remaining undiluted atop the groundwater table, and would prevent the lateral flow and surfacing of undiluted effluent.

- The number of ponds would be reduced from nine to four; the area covered by the ponds (22 acres) would not change. One of these four ponds would be in service at any time, with the other three in stages of drying.

- The number of drains would be approximately 21 per pond, for a total number of approximately 84 drains. The design of 21 drains per pond would provide a 100 percent safety factor over the design flow rate.

The vertical drain system now proposed would be classified as a type of injection well, and would not be considered a percolation disposal system. Additional details are provided in Section 2.2.1.

2.2 ALTERNATIVES CONSIDERED IN DETAIL/PREFERRED ALTERNATIVE

The purpose of this FSEIS is to evaluate alternatives for final disposal methods of sewage effluent in order to comply with the RWQCB Cease and Desist Orders by the May, 1999 deadline. The FEIS/R ROD of August 26, 1997, (see Appendix D), selected the City of Oceanside outfall as the final disposal method. Subsequent to the FEIS/R ROD, the City of Oceanside denied the Marine Corps' use of the excess capacity of their outfall.

In accordance with the ROD, construction of the 22 acre Lemon Grove ponds has been started and approximately 82,000 lineal feet of pipelines to connect these ponds and STP 1, 2, 3, 8, and 13 have been completed. The portion of the ROD, which was not implemented, was the installation of approximately 16,000 lineal feet of connecting pipeline to the City of Oceanside's outfall.

All six alternatives carried through for detailed analysis in this FSEIS, including the No Action Alternative, provide for utilization of the Lemon Grove ponds and pipelines and for irrigation of the Marine Memorial Golf Course with effluent from STPs 1 and 2. The basic parameters of each alternative are summarized in Table 2-2. The maximum design average daily flow of effluent from STPs 1, 2, 3, 8, and 13 would be approximately 3.6 MGD. The projected design flow for STP 1 is 0.54 MGD, STP 2 is 0.35 MGD, STP 3 is 0.55 MGD, STP 8 is 0.10 MGD and STP 13 is 2.0 MGD.

2.2.1 <u>Alternative 1: Discharge of Secondary Effluent at Lemon Grove in Percolation Ponds with Cased Vertical Drains</u>

Alternative 1 was developed to comply with the May 1999 deadline for compliance with the RWQCB Cease and Desist Orders, comply with water quality standards, maintain beneficial use of groundwater basins, and minimize salt water intrusion into the Santa Margarita Basin.

With implementation of Alternative 1, the effluent from STPs 1 and 2 (0.9 MGD) would be used to irrigate the Marine Memorial Golf Course, with the excess conveyed to the Lemon Grove ponds, which are being constructed per the FEIS/R ROD. The total effluent from STPs 3, 8, and 13, (2.7 MGD) would be conveyed to the Lemon Grove ponds. Cased vertical drains would be constructed within the Lemon Grove ponds to discharge the effluent to the groundwater. Without these drains, there would be inadequate percolation capacity for the total effluent. Design and construction of Alternative 1 would take approximately six months, with the system being operational in the year 1999. This alternative would achieve compliance with the RWQCB Cease and Desist Orders May, 1999 deadline.

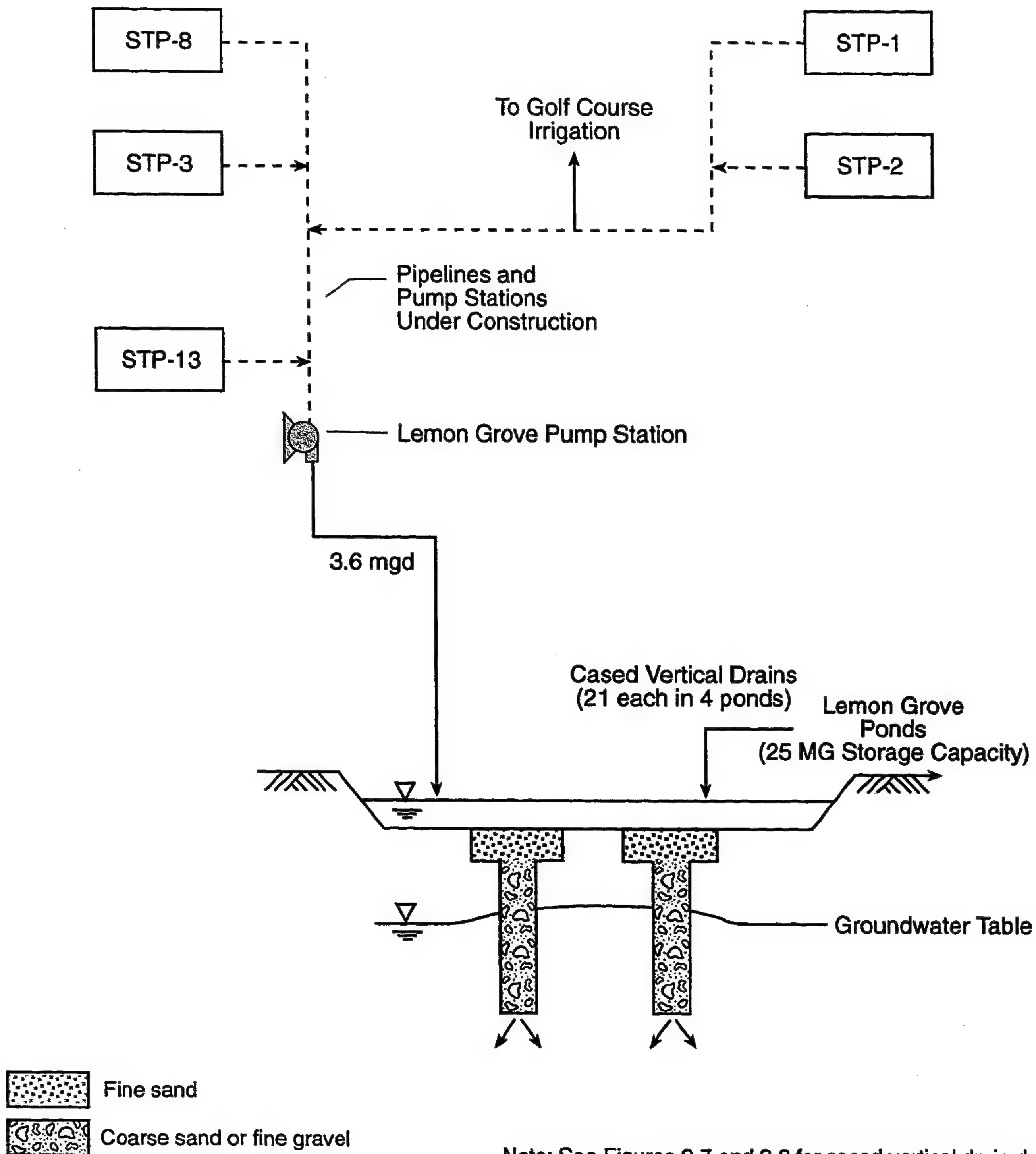
Table 2-2
Alternatives Considered in Detail

Phase	STP	Design Flow	Treatment Level	Disposal Site	Disposal Method	Construction Time	Compliance with Cease & Desist Order
Alternative 1							
1	1, 2, 3, 8, 13	3.6 MGD	Secondary	Base golf course and Lemon Grove ponds	Irrigation with excess to Vertical drains	6 months	Yes
Alternative 2							
1	1, 2, 3, 8, 13	3.6 MGD	Secondary	Base golf course and Lemon Grove ponds	Irrigation with excess to vertical drains	6 months	Yes
2	1, 2	0.9 MGD	AWT	Base golf course and Lemon Grove ponds	Irrigation with excess to vertical drains	15 months	
	3, 8, 13	2.65 MGD	Secondary	Lemon Grove ponds	Vertical drains		
Alternative 3							
1	13	2.0 MGD	Tertiary (Nutrient removal)	Ysidora Flats	Blended for groundwater recharge	24 months	No
	1, 2, 3, 8	1.54 MGD	Secondary	Base golf course and Lemon Grove ponds	Irrigation with excess to vertical drains		
Alternative 4							
1	1, 2, 3, 8, 13	3.6 MGD	AWT	Base golf course and Lemon Grove ponds	Irrigation with excess to gravity injection wells	18 months	No
Alternative 5							
1	1, 2, 3, 8, 13	3.6 MGD	AWT	Base golf course, on-Base agriculture fields and Lemon Grove ponds	Golf course and crop irrigation and gravity injection wells (excess only)	20 months	No

AWT - Advanced water treatment

Figures 2-4 through 2-8 show a schematic flow diagram, the proposed locations of the facilities, a plan view of the ponds, and plan and cross-section of the vertical drains. Features of Alternative 1 would include the following:

- Use of the Lemon Grove percolation ponds, as described in the FEIS/R. The ponds would have a total storage volume of approximately 25 million gallons. Four ponds would be constructed below the existing grade elevation, by excavation of approximately one to five feet of soil. The soil at the bottom of the ponds will be tested during construction to assure a low permeability. Some of the excavated materials would be used to form berms between the separate basins; the berms may extend above the existing grade elevation, and would be designed to control surface drainage. The ponds would not be lined.



Note: See Figures 2-7 and 2-8 for cased vertical drain details.

SOURCE: Montgomery Watson, 1998

Figure 2-4

Alternative 1
Cased Vertical Drains in Lemon Grove Ponds
Schematic Flow Diagram

9416 P-527/Figures/Figure 2-4 Alternative 1

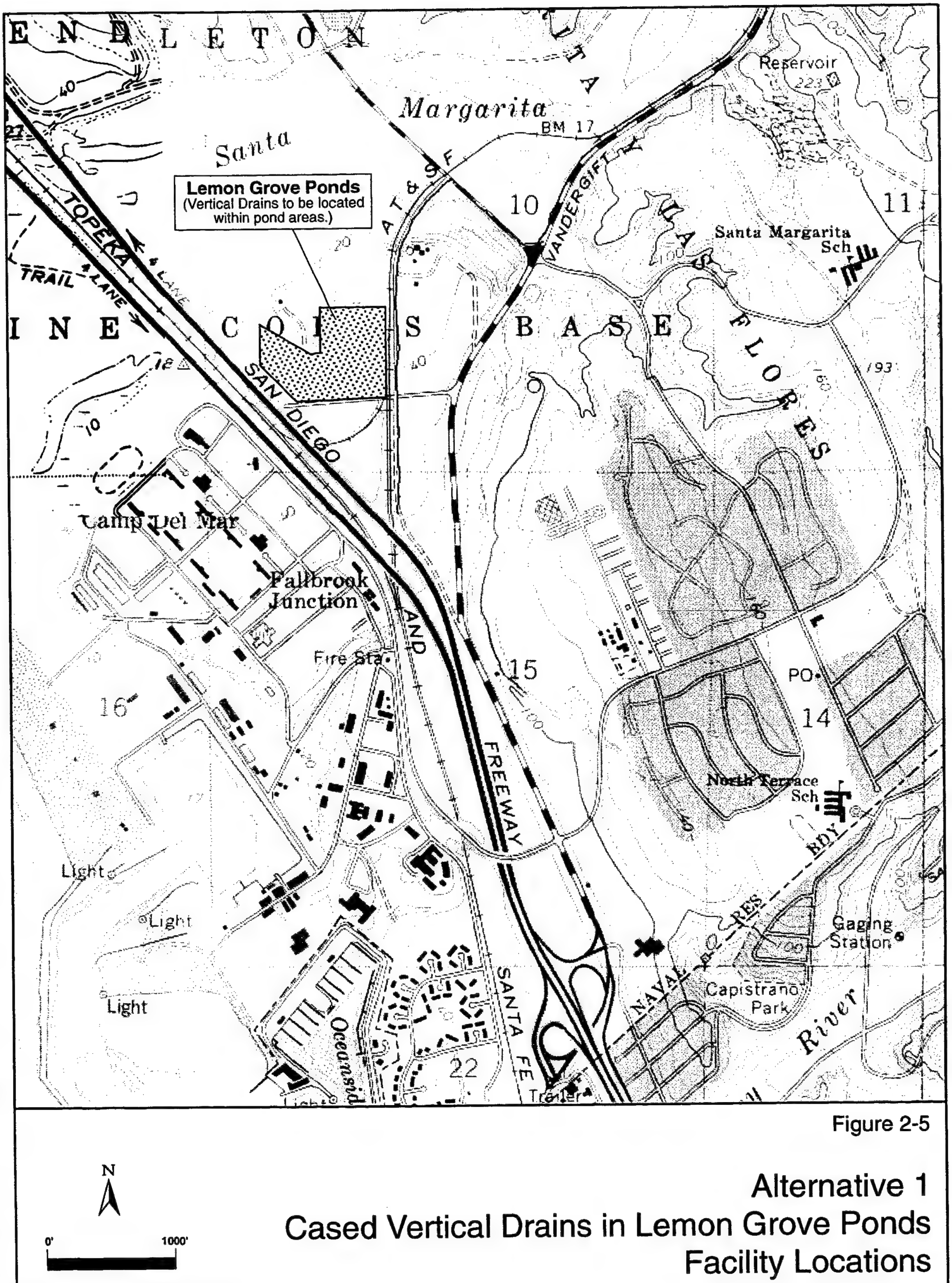
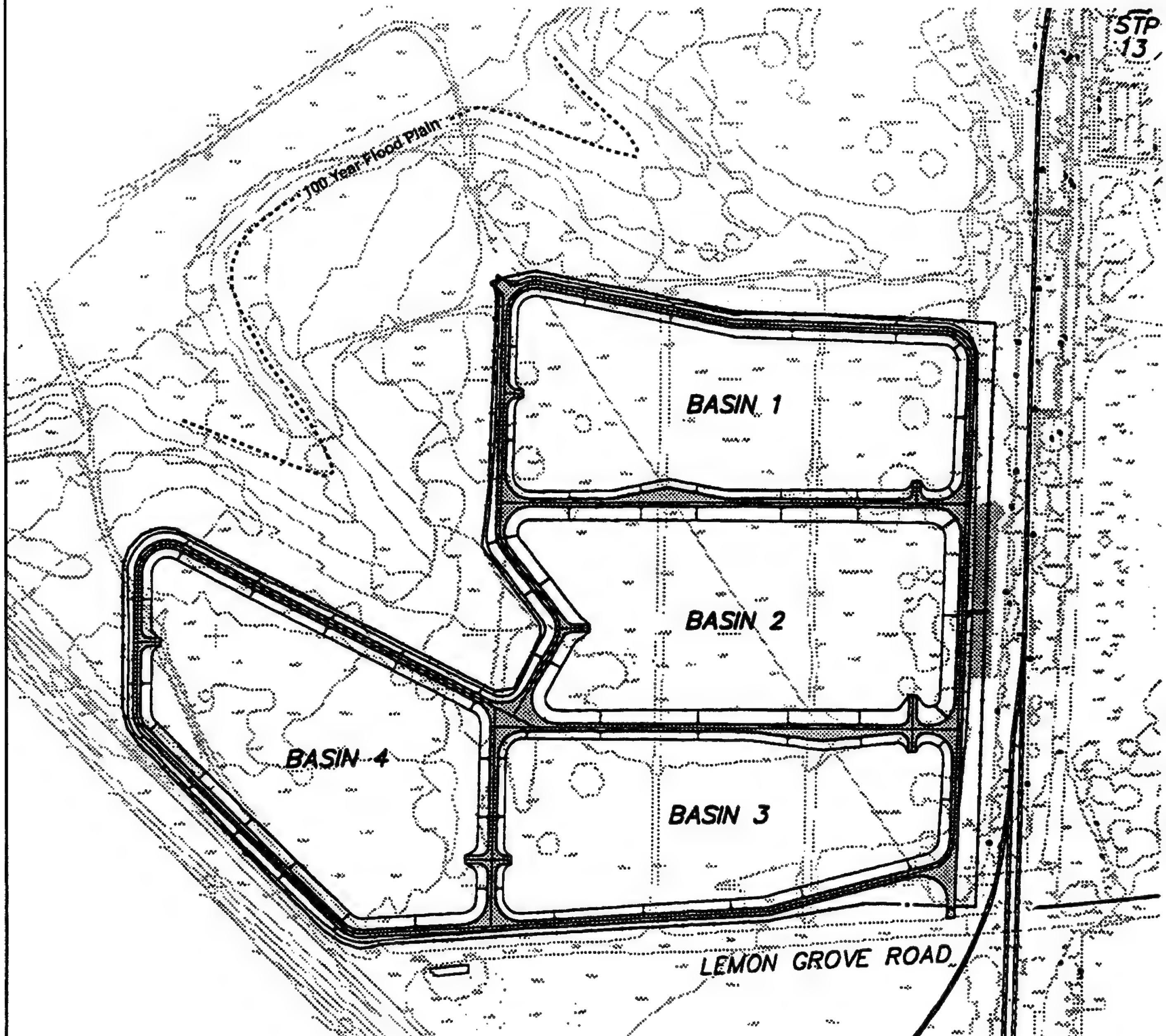


Figure 2-5

Alternative 1
Cased Vertical Drains in Lemon Grove Ponds
Facility Locations



N

0' 250'

Figure 2-6

Lemon Grove Ponds

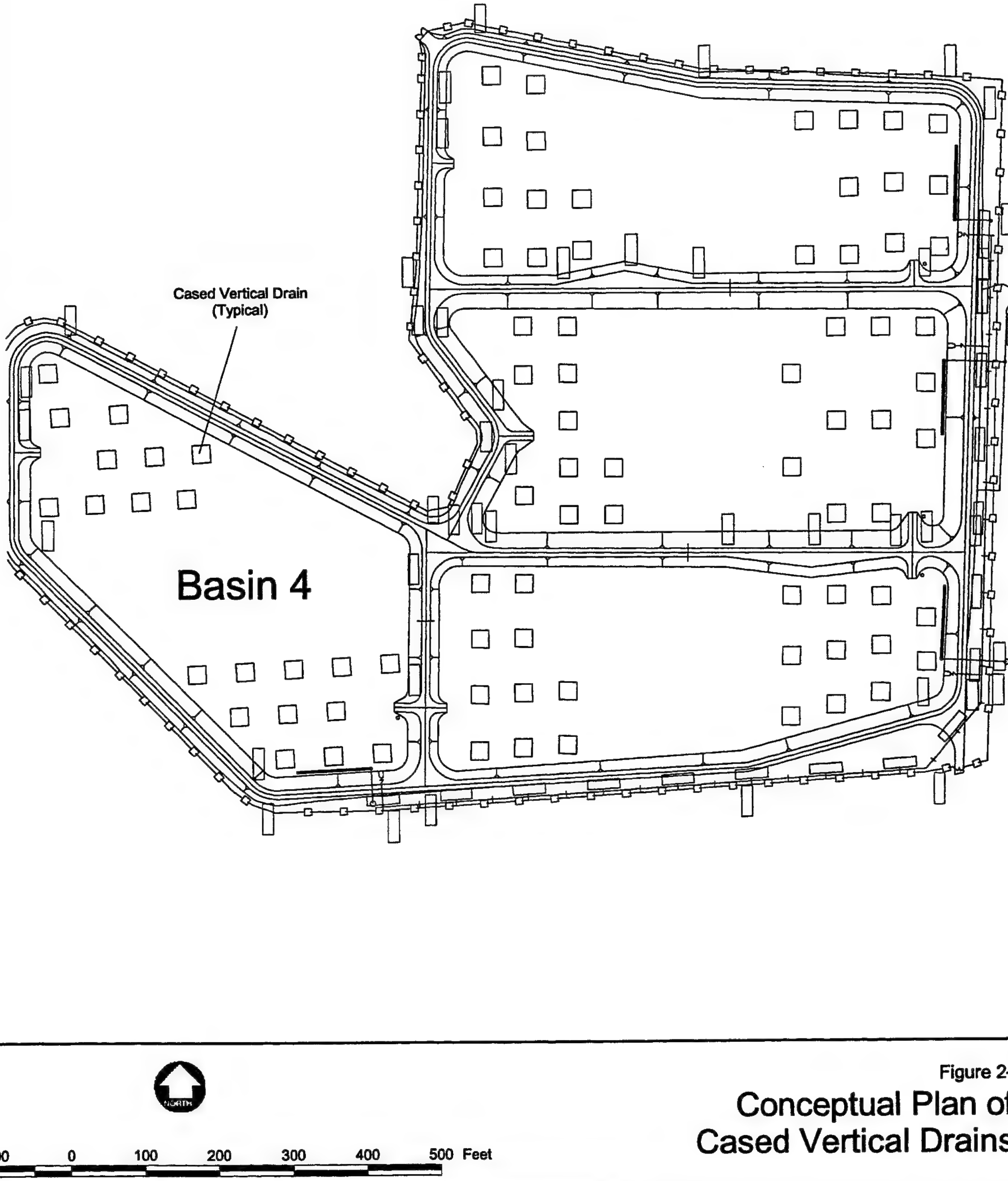


Figure 2-7
Conceptual Plan of
Cased Vertical Drains

9416.6 P-527/GIS/9416.6 P-527 (Latest)/Figure 2-7.apr

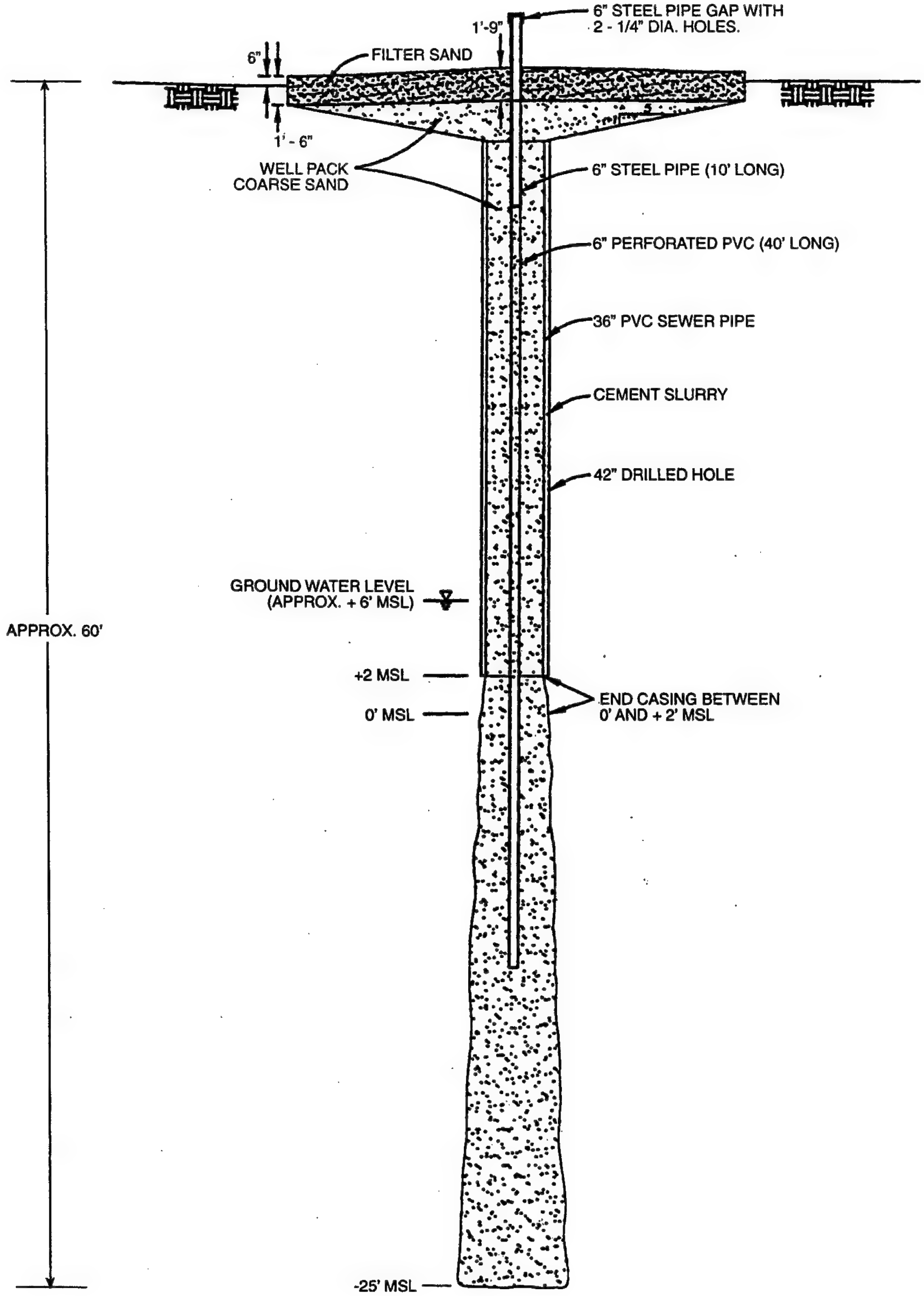


Figure 2-8

Cased Vertical Drain - Cross Section

- Construction of approximately 21 vertical drains is proposed within each of the ponds for a total of approximately 84 vertical drains. The system of ponds and drains would be capable of disposing of the design flow of 3.6 MGD. The vertical drains would be positioned nominally 80 feet on center. Each drain would have a diameter of three feet and would be cased to an elevation of 0-+2 feet mean sea level (MSL) and extend to a depth of elevation -25 feet MSL, in order to discharge directly into the groundwater table. The total drain depth would be approximately 60 feet. The drains would be filled with coarse sand or fine gravel. The purpose of the casing the drains would be to convey the effluent discharge to the groundwater table where it would mix with the groundwater rather than remaining undiluted atop the groundwater table. The upper portion of each drain would be widened and filled with a layer of fine sand in order to filter suspended solids in the secondary effluent. The purpose of the sand filter would be to prevent clogging the vertical drains, thereby extending drain life. Approximately 5,000 cubic yards of sand and gravel would be imported for the vertical drains and sand filters.

- Pond and drain operation would be cyclic, with one pond being loaded for approximately three days, then drained for approximately nine days of rest and drying, with the next pond coming into service.

- During periods when the flow of secondary effluent from the STPs would exceed the disposal capacity of the normally in-service pond, an additional pond would be placed in service.

2.2.2 <u>Alternative 2: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains plus Advanced Wastewater Treatment and Reclamation of a Portion of the Effluent (Preferred Alternative)</u>

Alternative 2 was developed to comply with the May 1999 deadline for compliance with the RWQCB Cease and Desist Orders, comply with water quality standards, maintain beneficial use of groundwater basins, minimize salt water intrusion into the Santa Margarita Basin, and to sustain the volume of ground water in the Lower Santa Margarita basin.

Alternative 2 would be implemented in two phases. With implementation of Phase 1, the effluent from STPs 1 and 2 (0.9 MGD) would be used to irrigate the Marine Memorial Golf Course, with the excess conveyed to the Lemon Grove ponds, which are being constructed per the FEIS/R ROD. The total effluent from STPs 3, 8, and 13, (2.7 MGD), would be conveyed to the Lemon Grove ponds. Vertical drains would be constructed within the Lemon Grove ponds to discharge the effluent to the groundwater. Design and construction of Phase 1 would take approximately six months, with the system being operational in the year 1999. Therefore, this alternative would achieve compliance with the RWQCB Cease and Desist Orders by the May 1999 deadline.

Phase 2 would add a system for advanced wastewater treatment[2] of the effluent from STPs 1 and 2 (0.9 MGD). The secondary effluent from STPs 3, 8 and 13 (2.7 MGD) would be conveyed to the Lemon Grove ponds, which were previously constructed per the FEIS/R ROD. The treated effluent from STPs 1 and 2 would be used to irrigate the Marine Memorial Golf Course, with the unused portion conveyed to the Lemon Grove ponds. A valve would be installed in the pipeline adjacent to Vandegrift Boulevard at Ysidora Flats to enable future delivery of the advanced treatment effluent to support the long-term goal of returning water to the river in compliance with the Basin Plan. Design and construction of Phase 2 of Alternative 2 would take approximately 15 months, with the system being operational in the year 2000.

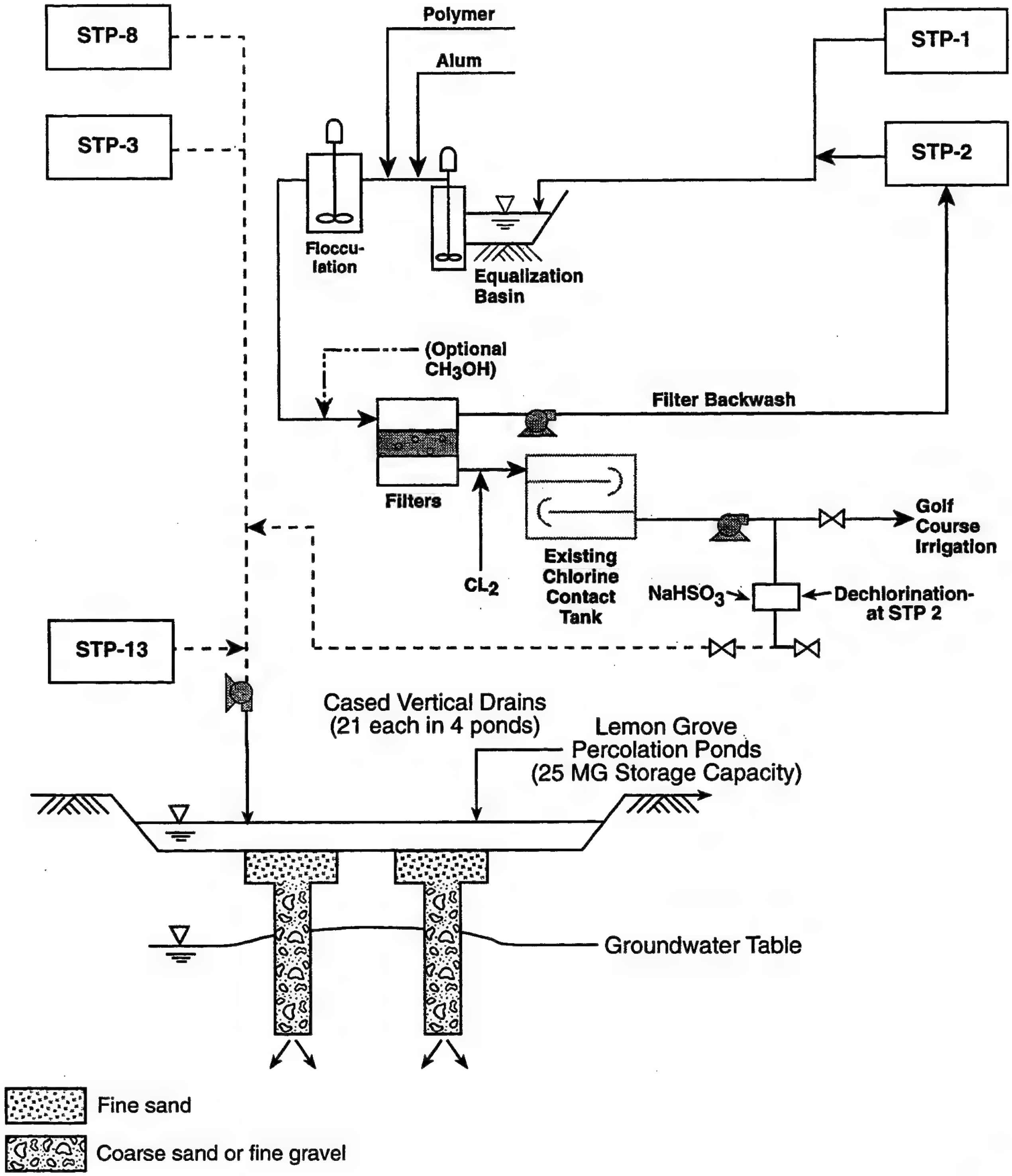
A schematic diagram for Alternate 2 is shown in Figure 2-9; the proposed location of the facilities to be used for Phase 2 of Alternative 2 are shown in Figures 2-10 and 2-11. Features of Phase 1 of Alternative 2 would include the following:

- Use of the Lemon Grove ponds, as described in the FEIS/R. The ponds would have a total storage volume of approximately 25 million gallons. Four ponds would be constructed below the existing grade elevation, by excavation of approximately one to five feet of soil. The soil at the bottom of the ponds will be tested during construction to assure a low permeability. Some of the excavated materials would be used to form berms between the separate basins; the berms may extend above the existing grade elevation, and would be designed to control surface drainage.

- Construction of approximately 21 vertical drains is proposed within each of the ponds for a total of approximately 84 vertical drains. The system of ponds and drains would be capable of disposing of the design flow of 3.6 MGD. The ponds would not be lined.

  The vertical drains would be positioned nominally 80 feet on center. Each drain would have a diameter of three feet and would be cased to an elevation of 0-+2 feet mean sea level (MSL) and extend to a depth of elevation -25 feet MSL, in order to discharge directly into the groundwater table. The total drain depth would be approximately 60 feet. The drains would be filled with coarse sand or fine gravel. The purpose of casing the drains would be to convey the effluent discharge to the groundwater table where it would mix with the groundwater rather than

[2] The advanced treatment for effluent from STPs 1 and 2 would be secondary treatment plus removal of particulate matter and chlorination, without nutrient removal.

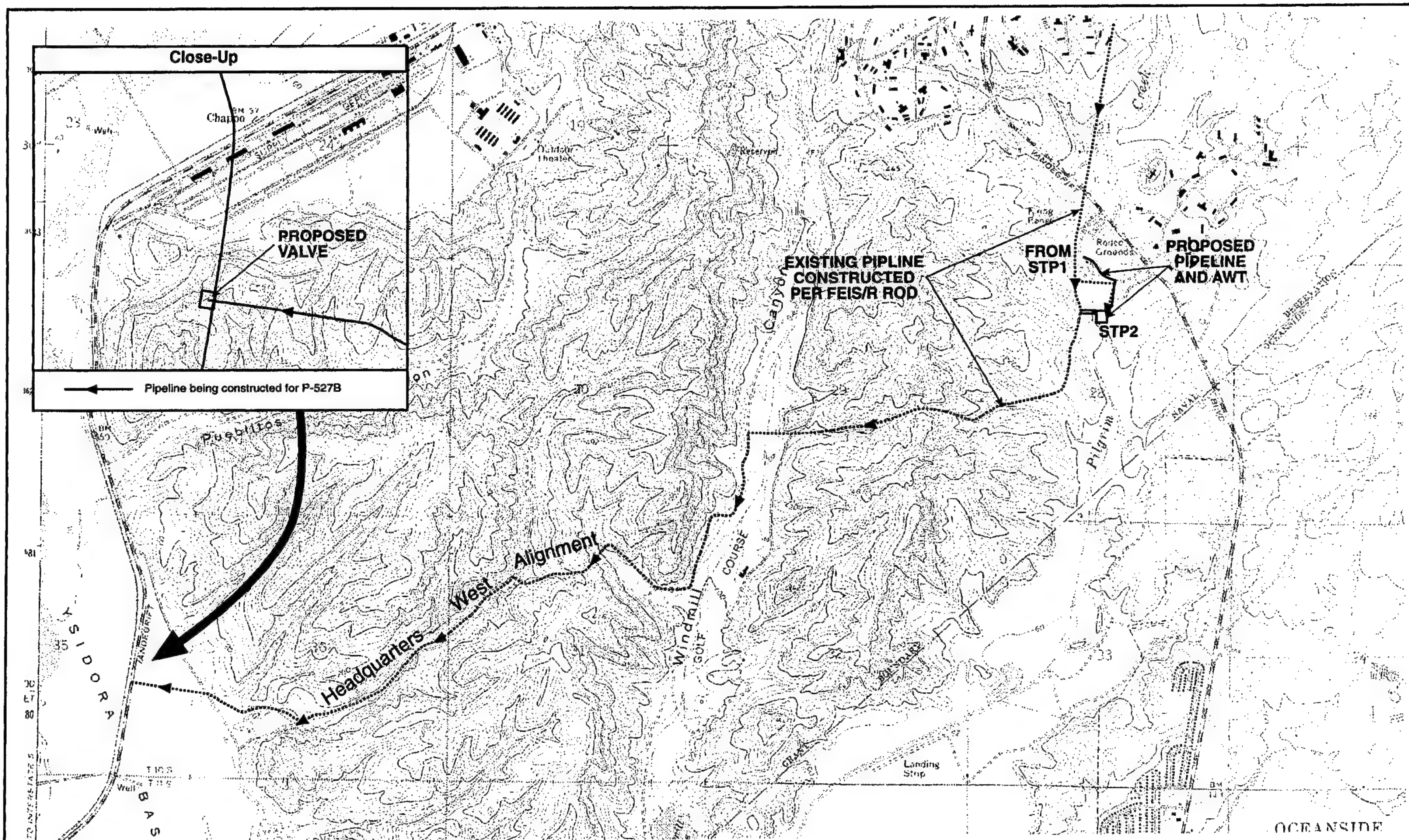


SOURCE: Montgomery Watson

Figure 2-9

Alternative 2
Vertical Drains in Lemon Grove Ponds plus Reclamation of Advanced Treated Wastewater

9416 P-527/Figures/Figure 2-9 Alt 2 Vert Drains



NOTE: Scaled down to 70% from original USGS

Figure 2-10

Alternative 2
Location of Phase 2 Facilities

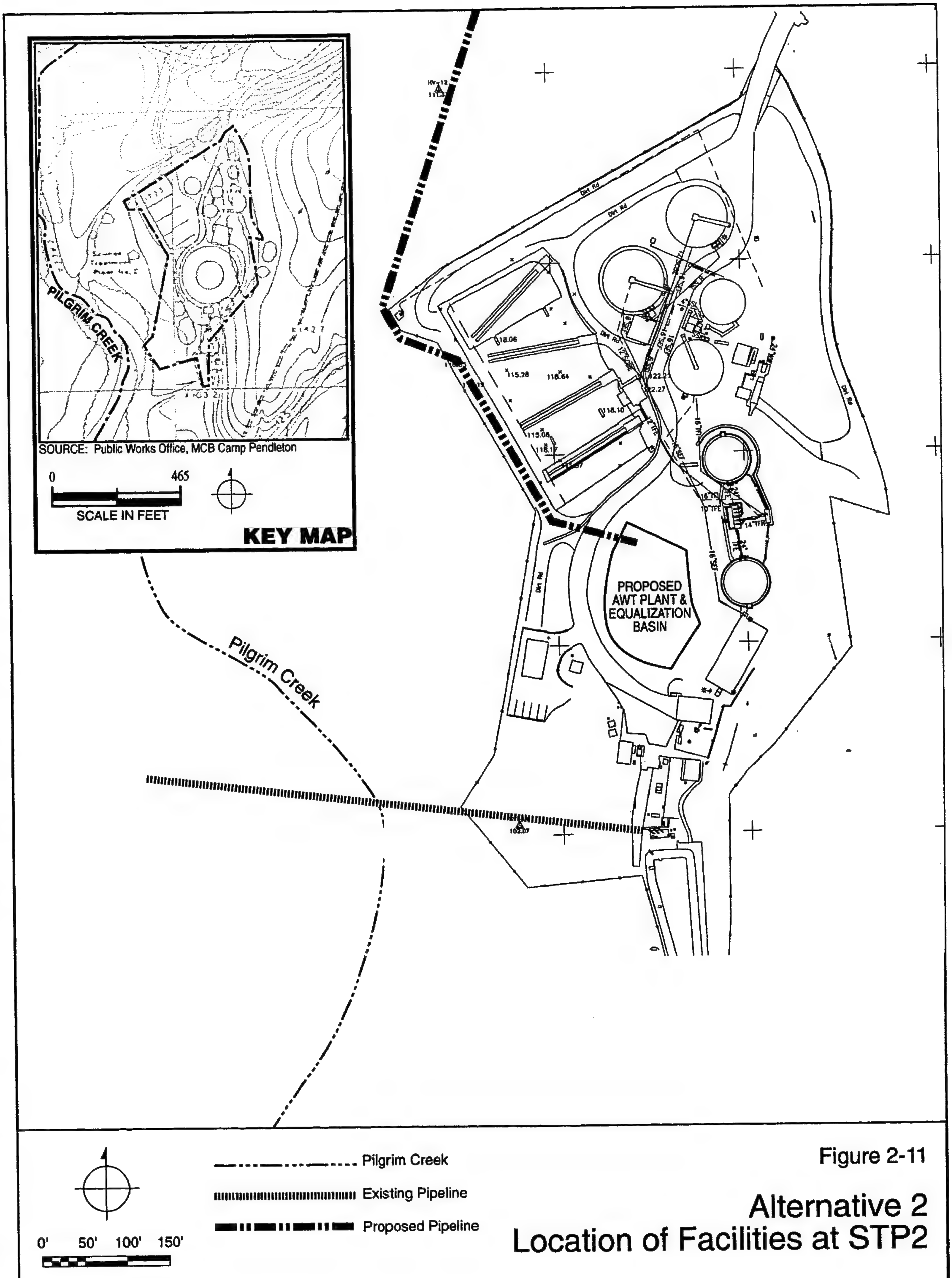


Figure 2-11

Alternative 2
Location of Facilities at STP2

9416 P-527/Figures/Figure 2-11 Alt 2 Loc of Facil

remaining undiluted atop the groundwater table. The upper portion of each drain would be widened and filled with a layer of fine sand in order to filter suspended solids in the secondary effluent. The purpose of the sand filter would be to prevent clogging of the vertical drains, thereby extending drain life. Approximately 5,000 cubic yards of sand and gravel would be imported for the vertical drains and sand filters.

- Pond and drain operation would be cyclic, with one pond being loaded for approximately three days, then drained for approximately nine days of rest and drying, with the next pond coming into service.

- During periods when the flow of secondary effluent from the STPs would exceed the disposal capacity of the normally in-service pond, an additional pond would be placed in service.

Features of Phase 2 of Alternative 2 would include the following:

- Construction of a connecting pipeline from the STP 1 effluent pipeline west of STP 2 to a new equalization basin within STP 2. The connection at the STP 1 pipeline would include a valve to provide the option for STP 1 effluent to go into or bypass STP 2. The pipeline would be installed by trenching, except for the crossing of Pilgrim Creek, where boring and jacking beneath the existing culverts would be used to minimize disturbance of the creek.

- Construction of a 230,000 gallon equalization basin within the existing, fenced STP 2 area. Secondary effluent from STPs 1 and 2 would be conveyed to the equalization basin. The equalization basin would provide effluent storage in order to minimize changes in the rate of advanced wastewater filtration.

- Construction of an advanced wastewater treatment facility, including flocculation, filtration and chlorination processes, at STP 2. This facility would have a nominal capacity of 0.9 MGD, and would treat the combined effluent from STPs 1 and 2. Treatment would satisfy criteria for unrestricted irrigation of landscape where public contact is probable. Nitrogen and phosphorous removal would not be included.

- Treated effluent from STP 1 and 2 would be discharged to the Marine Memorial Golf Course as required for adequate irrigation. The annual average water use is approximately 0.5 MGD. Peak demand during the dry, summer months is estimated at 0.75-1.25 MGD.

- Construction and installation of equipment for dechlorination of STP 1 and 2 effluent prior to discharge. The equipment would be located within the STP 2 fence line.

- Treated effluent that would be surplus to the golf course requirements would be conveyed to the Lemon Grove ponds for discharge to groundwater through the vertical drains. Golf course water demand would be likely to exceed the effluent supply during the hotter summer periods.

- Construction of a valve connection adjacent to Vandegrift Boulevard at Ysidora Flats near the western terminus of the Headquarters West pipeline, which is being constructed to convey STP 1 and 2 effluent to Lemon Grove (Figure 2-8). The valve would allow a future connection to an existing pipeline which runs north and west to Ysidora Flats. A test program approved by the cognizant resource agencies would be required to monitor the effects of the discharge. This discharge would require approval and a permit from RWQCB, and an amendment to the Basin Plan, and would necessitate further environmental review.

2.2.3 Alternative 3: Tertiary Treated Effluent Blended with Secondary Effluent for Groundwater Recharge at Ysidora Flats

Alternative 3 was developed to comply with the water quality standards of the RWQCB Cease and Desist Orders, maintain beneficial use of groundwater basins, minimize salt water intrusion into the Santa Margarita Basin, and to achieve increased groundwater recharge at Ysidora Flats. Alternative 3 includes surface discharge in that area.

With implementation of Alternative 3, a tertiary treatment[3] facility would be constructed at STP 13. The treated effluent from STP 13 (2.0 MGD) would be pumped to the Ysidora Flats area and combined with the remainder of secondary effluent from STPs 1 and 2, after irrigation of the Marine Memorial Golf Course, plus the secondary effluent from STPs 3 and 8 (0.7 MGD). The blended effluent from all five STPs (up to 3.6 MGD) would be discharged into the Santa Margarita River at Ysidora Flats. The Lemon Grove ponds, which are being constructed per the FEIS/R ROD, would be used for storage of tertiary treated effluent from STP 13. Design and construction of Alternative 3 would take approximately 24 months. Therefore, this alternative would not achieve compliance with the RWQCB Cease and Desist Orders' deadline of May, 1999. Also, the tertiary treatment of effluent from STP 13 could not be accomplished within the funding limits authorized by Congress for this project. Therefore, this alternative would require additional Congressional funding. This alternative would not be operational before the year 2004.

[3] The tertiary treatment for STP 13 would include filtration, nutrient removal, and chlorination. Nitrogen and phosphorous would be reduced by biological processes.

A flow diagram for Alternative 3 is shown in Figure 2-12 and the proposed locations of the tertiary treatment facilities to be used for Alternative 3 are shown in Figure 2-13. Features of Alternative 3 would include the following:

- Construction and operation of an tertiary treatment plant adjacent to STP 13. Tertiary treatment would include filtration, nutrient removal, and chlorination. Nitrogen and phosphorous would be reduced by biological processes.

- Construction of a pump station and approximately 13,000 feet of piping to convey treated effluent to the proposed outfall site at Ysidora Flats. The pipeline would be constructed in a trench parallel to the Santa Margarita pipeline installed to convey effluent from STPs 1, 2, 3, and 8 to Lemon Grove (Figure 2-1) as part of the project approved in the FEIS/R.

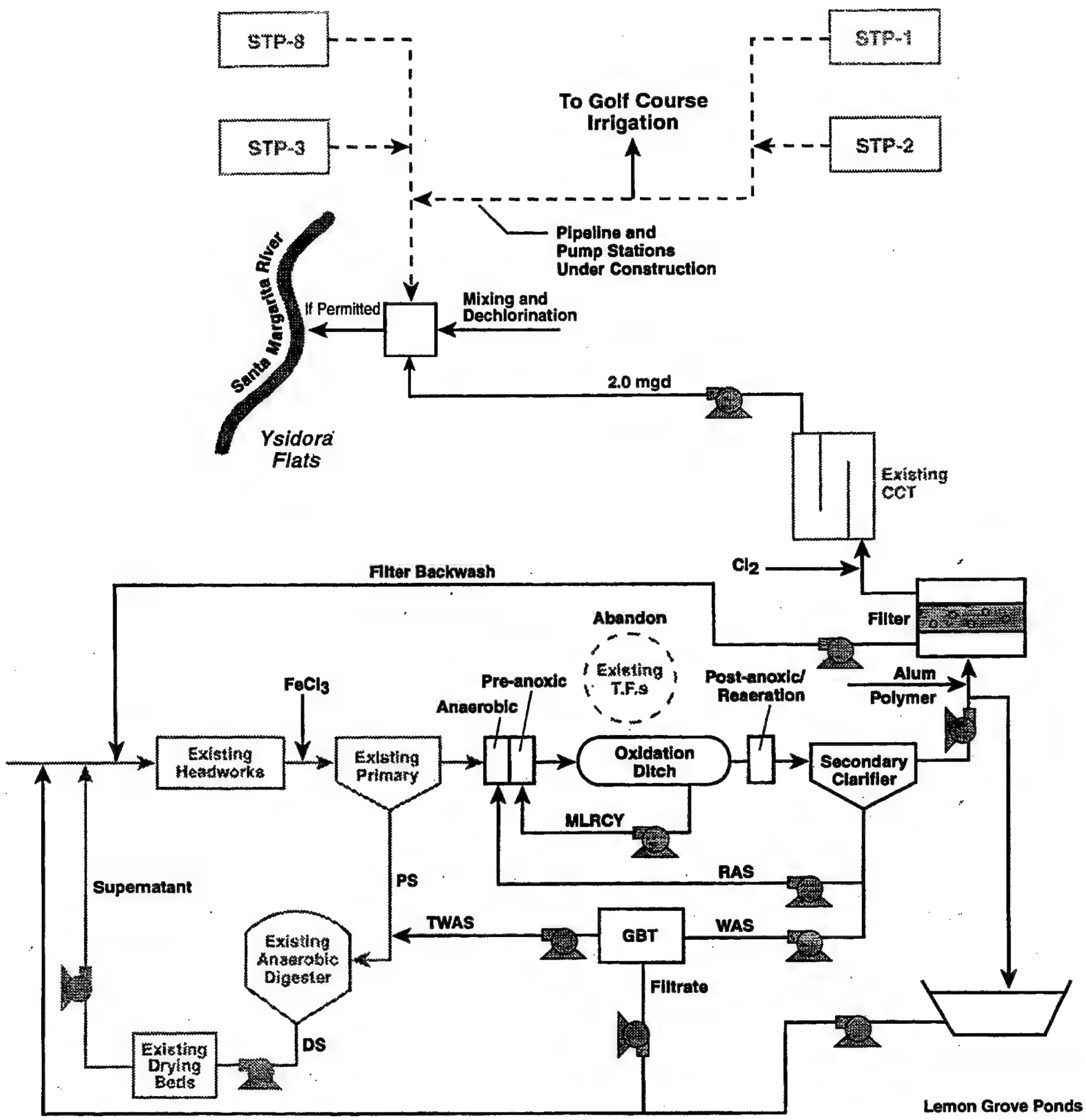
- Construction of valves and turnout in the Santa Margarita pipeline to direct the secondary effluent from STPs 1, 2, 3, and 8 to the Ysidora Flats area.

- Construction of a dechlorination facility at the Ysidora Flats area where the two effluent streams would be blended and discharged through an existing pipeline to the river (Figure 2-8). The equipment would be located on the Ysidora Flats access corridor and would be sited to avoid or minimize impact to the wetlands mitigation site.

- Construction of a discharge pipe and outfall structure in the Ysidora Flats outfall area. The structure would consist of a concrete pad with riprap in order to dissipate the energy of the effluent discharge. Alternatively, detailed design and hydrological analysis may dictate the design of a multi-point discharge, such as a series of pipes with small openings in order to spread the discharge and enhance local use of the effluent.

- Use of the ponds constructed at the Lemon Grove site. The vertical drains described in Alternatives 1 and 2 would not be constructed.

- During periods when the flow of secondary effluent from STP 13 would exceed the treatment capacity of the tertiary treatment plant, excess effluent will be stored in the ponds.



Abbreviations:

CCT	=	Chlorine Contact Tank
DS	=	Digested Sludge
GBT	=	Gravity Belt Thickener
MLRCY	=	Mixed Liquor Recycle
PS	=	Primary Sludge
RAS	=	Return Activated Sludge
TF	=	Trickling Filter
TWAS	=	Thickened Waste Activated Sludge
WAS	=	Waste Activated Sludge

SOURCE: Montgomery Watson, 1998

Figure 2-12

Alternative 3
Groundwater Recharge at Ysidora Flats

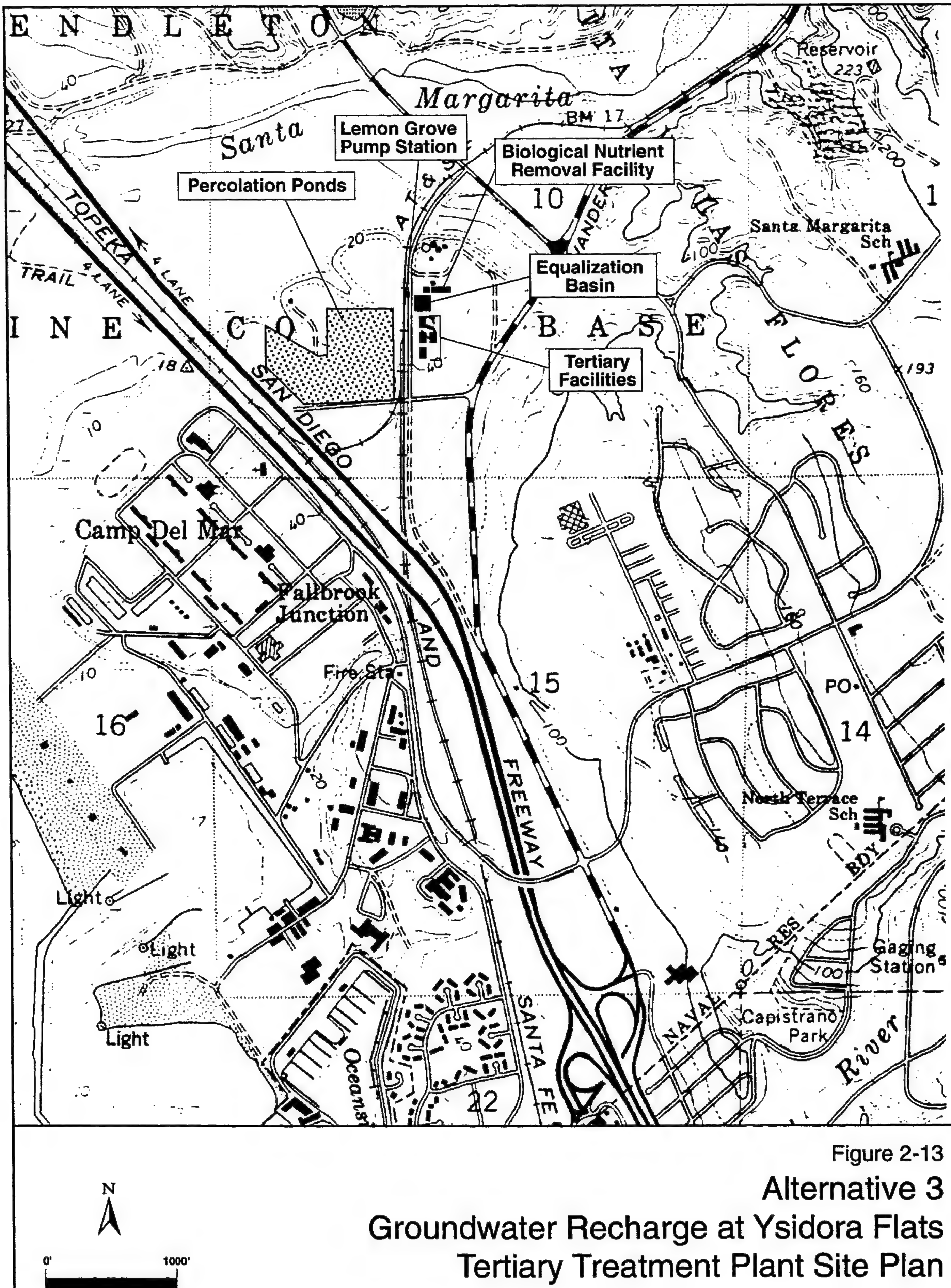


Figure 2-13

Alternative 3
Groundwater Recharge at Ysidora Flats
Tertiary Treatment Plant Site Plan

9416 P-527/Figures/Figure 2-13 Alt 3 Groundwater

2.2.4 Alternative 4: Advanced Wastewater Treatment and Discharge in Cased Wells at Lemon Grove

Alternative 4 was developed to comply with the water quality standards of the RWQCB Cease and Desist Orders, maintain beneficial use of groundwater basins, and minimize salt water intrusion into the Santa Margarita Basin.

With implementation of Alternative 4, the effluent from STPs 1 and 2 (0.9 MGD) would be used to irrigate the Marine Memorial Golf Course, with the excess conveyed to the STP 13 for advanced wastewater treatment[4], and then to the previously constructed Lemon Grove ponds for disposal. The total effluent from STPs 3, 8, and 13, (2.7 MGD) would be conveyed to STP 13 for advanced wastewater treatment, and then to the previously constructed Lemon Grove ponds for disposal. The treated effluent would be conveyed to the water table through cased, gravity injection wells in the Lemon Grove ponds. Design and construction of Alternative 4 would take approximately 18 months, with the system being operational in the year 2000. Therefore, this alternative would not achieve compliance with the RWQCB's May, 1999 deadline of the Board's Cease and Desist Orders.

A flow diagram for Alternative 4 is shown in Figure 2-14 and the proposed locations of the facilities to be used for Alternative 4 are shown in Figure 2-15. Features of Alternative 4 would include the following:

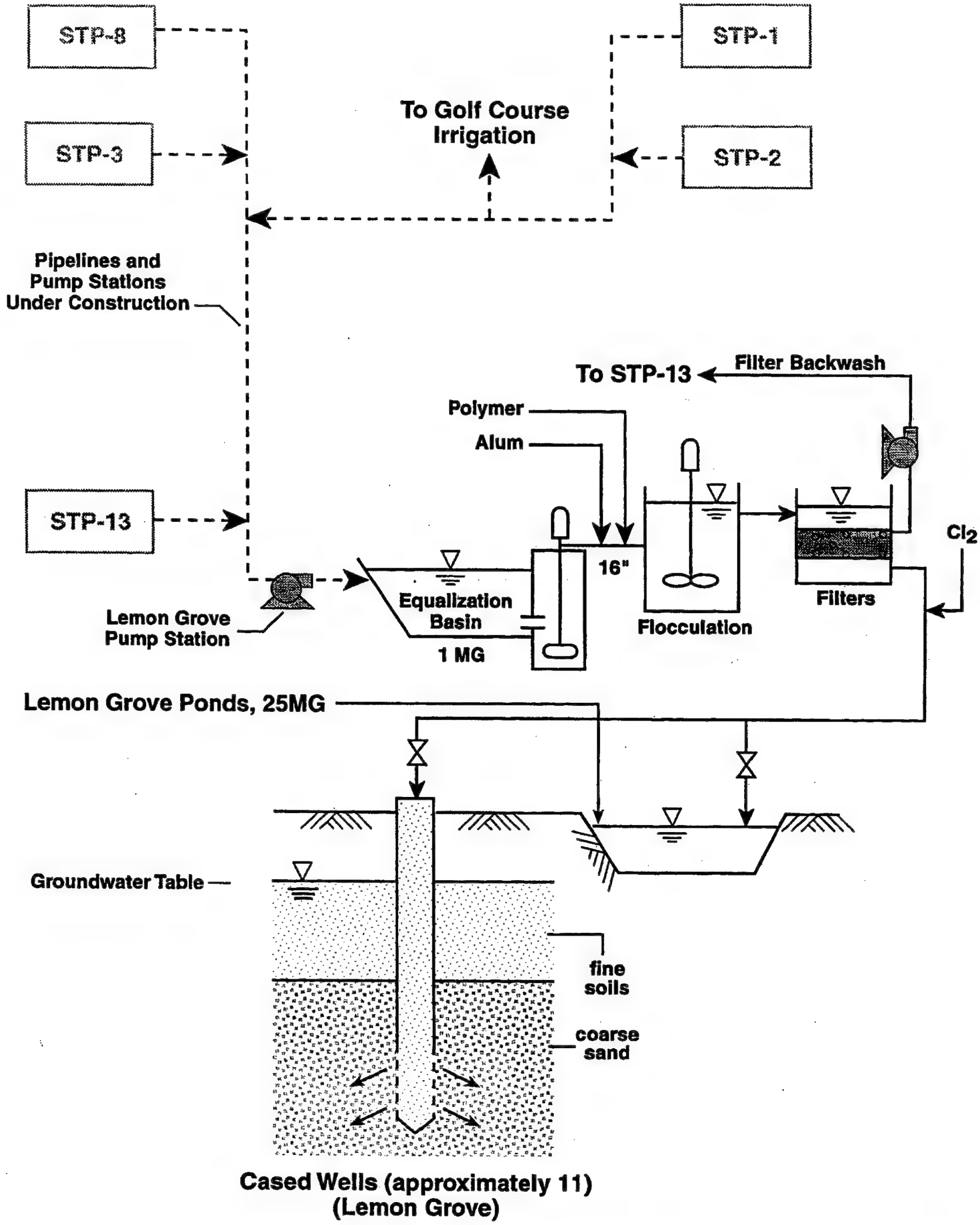
- Construction of a two-million-gallon (2 MG) equalization basin south of STP 13. The basin would be designed with an approximate balance of cut and fill, with minimal material export. Secondary effluent from STPs 1, 2, 3, 8, and 13 would be conveyed to the equalization basin, with excess effluent conveyed to storage ponds.

- Construction and operation of an AWT plant adjacent to STP 13. Secondary effluent from the equalization basin would be pumped through piping where chemical addition and flocculation would occur. The effluent would then be processed through filters and chlorinated. The process would reduce the total suspended solids from approximately 15 parts per million (ppm) to 5 ppm.

- Use of the ponds constructed at the Lemon Grove site.

- Construction of 11 cased, gravity injection wells, each approximately 6-12 inches in diameter and 80-100 feet deep, and piping from the AWT plant to the wells. Approximately 50-60 feet

[4] The advanced treatment would be secondary treatment plus removal of particulate matter and chlorination, without nutrient removal.



SOURCE: Montgomery Watson

Figure 2-14

Alternative 4
Cased Wells at Lemon Grove Ponds
Schematic Flow Diagram

9416 P-527/Figures/Figure 2-14 Alt 4 Cased Wells

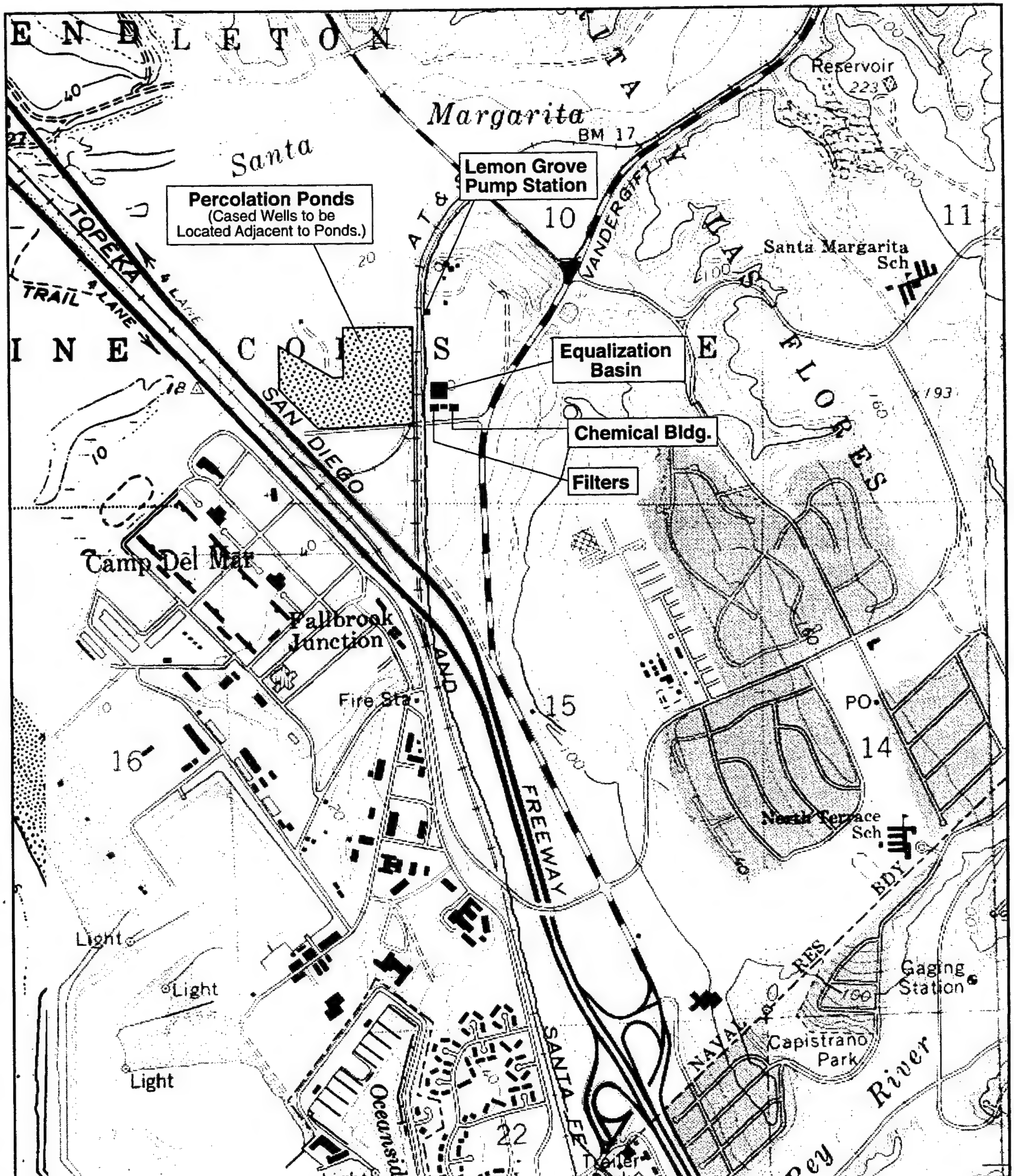


Figure 2-15

Alternative 4
Cased Wells at Lemon Grove Ponds
Site Plan

A flow diagram for Alternative 5 is shown in Figure 2-16 and the proposed locations of the facilities to be used for Alternative 5 are shown in Figure 2-17. Features of Alternative 5 would include the following:

- Construction of a 2 MG equalization basin south of STP 13, adjacent to the Lemon Grove ponds. Secondary effluent from STPs 1, 2, 3, 8, and 13 would be conveyed to the equalization basin, with excess effluent pumped to the storage ponds.

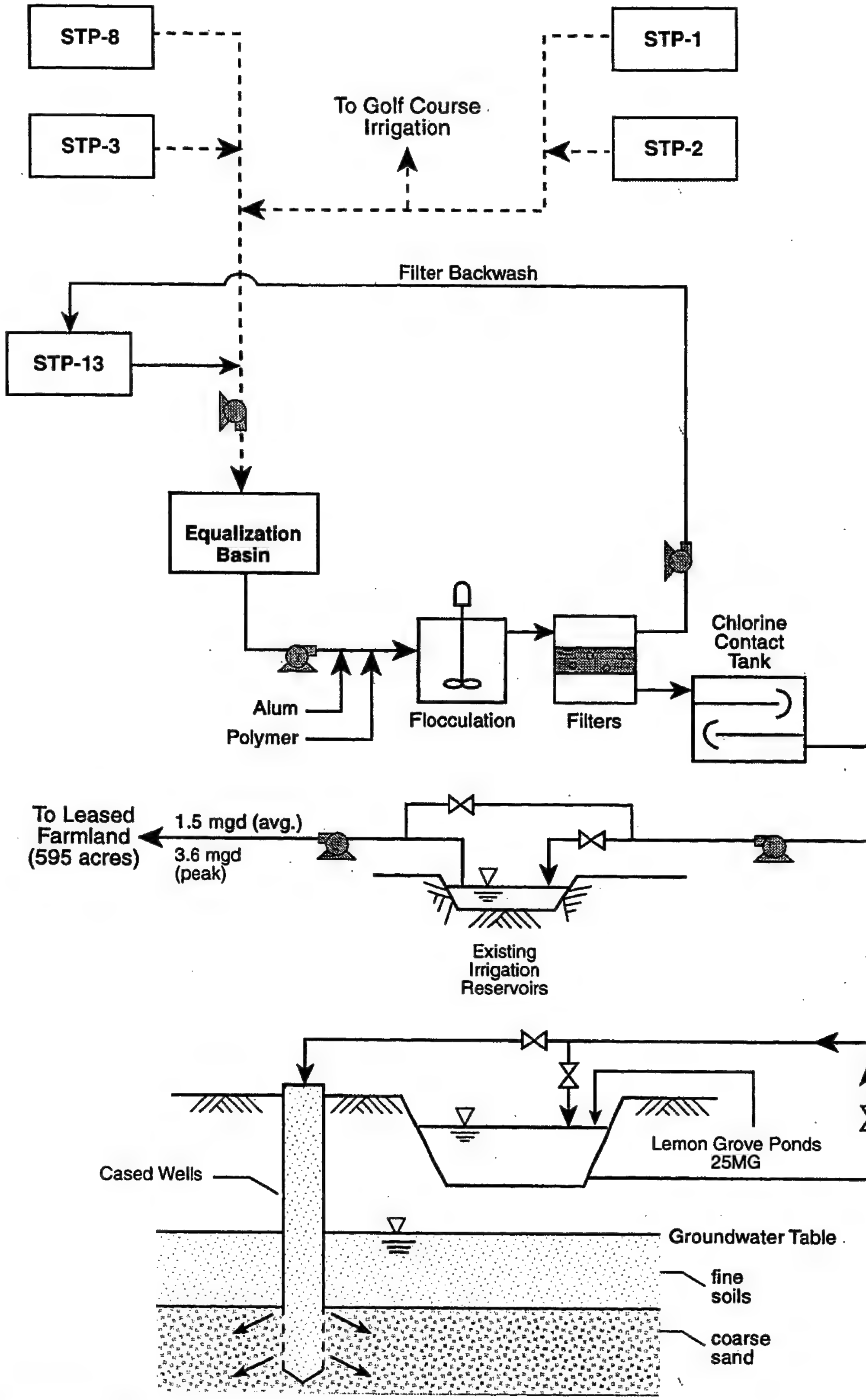
- Construction and operation of an AWT plant adjacent to STP 13. Secondary effluent from the equalization basin would be pumped to the AWT plant for filtration and disinfection. The AWT would improve the quality of the effluent to the standards required for irrigation of agricultural land, as specified in Title 22, Division 4 of the California Administrative Code.

- Construction of a pump station and approximately 7,000 feet of piping to convey the AWT effluent to an existing irrigation reservoir. All piping would be in existing roadways and the pipeline would be attached to the Stuart Mesa road bridge over the Santa Margarita River. The AWT effluent would then be conveyed by an existing system to irrigate on-Base, leased agricultural lands northwest of the Lemon Grove ponds, on the east and west sides of I-5.

- Use of the ponds constructed at the Lemon Grove site.

- Construction of approximately 11 cased, gravity injection wells, on the perimeter at the Lemon Grove ponds. The wells would be capable of disposing of 3.6 MGD of effluent. Details of well construction and operation are described in Section 2.2.4.

- The normal requirements for crop irrigation would vary seasonally and would range from 0.5 MGD to 3.4 MGD, with an average demand at 1.5 MGD (Montgomery Watson 1998). Effluent from the AWT plant which exceeds the requirements for crop irrigation would be discharged through the cased wells.



SOURCE: Montgomery Watson, 1998

Figure 2-16

Alternative 5 Agricultural Irrigation Schematic Flow Diagram

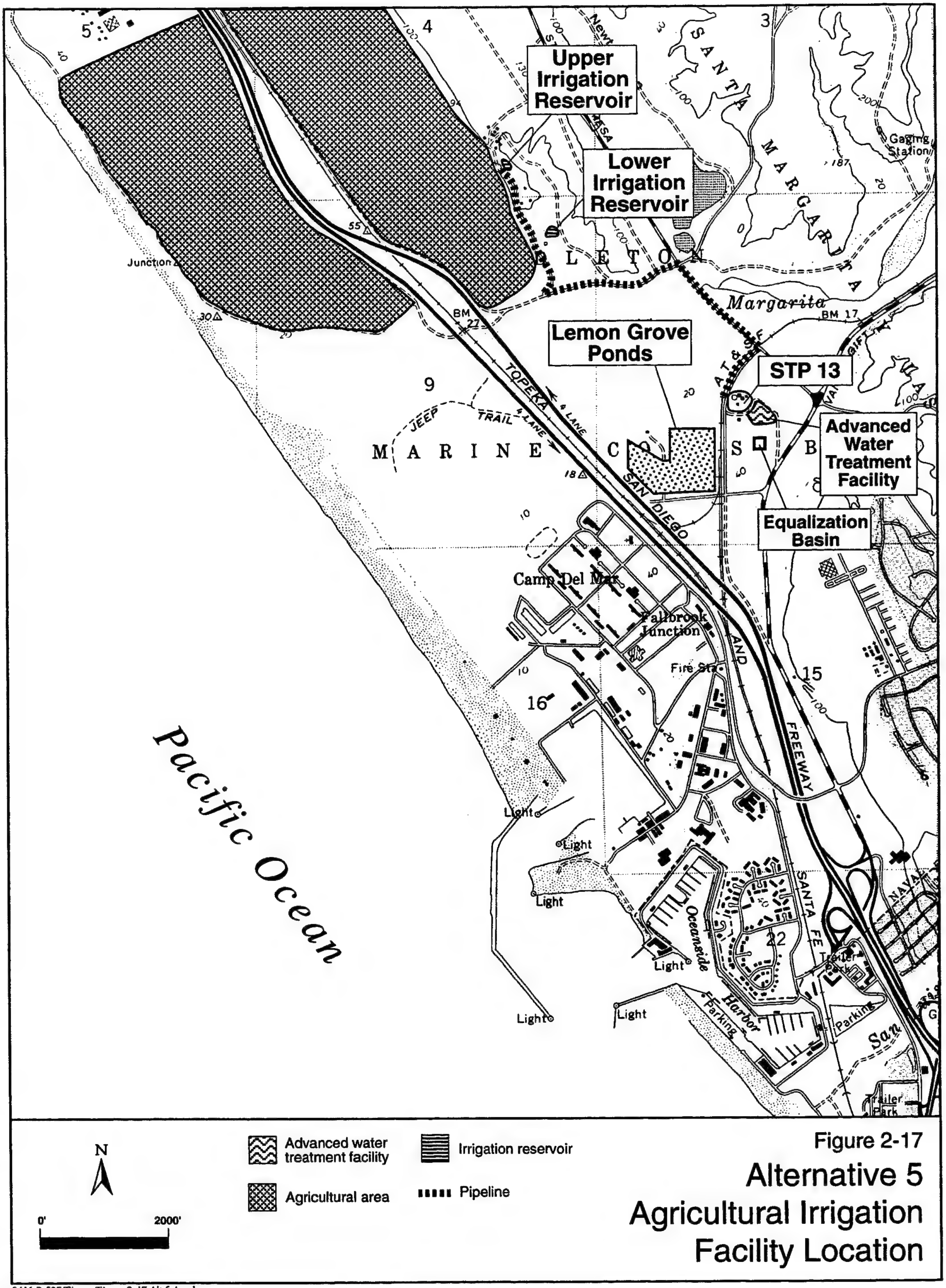


Figure 2-17
Alternative 5 Agricultural Irrigation Facility Location

9416 P-527/Figure/Figure 2-17 Alt 5 Agr Irr

2.2.6 No Action Alternative

With the No Action Alternative, there would be no construction of vertical drains, AWT plants, cased wells, agricultural irrigation, or other discharge systems as described in the proposed action alternatives. Effluent from STPs 1 and 2 would be used to irrigate the Marine Memorial Golf Course. The excess effluent, after golf course irrigation, plus the total effluent from STPs 3, 8, and 13 would be conveyed to the ponds at Lemon Grove in the system now being constructed. Disposal would be by a small amount of percolation and evaporation. When the Lemon Grove ponds are full and the rate of effluent generation exceeds the percolation/evaporation rate, effluent could be stored at or near the individual plants in the ponds now used for storage and percolation and planned for abandonment. When all storage ponds are full, excess effluent would be discharged to the Santa Margarita River adjacent to the Lemon Grove Ponds. The No Action Alternative would result in continued violation of the Basin Plan.

2.3 ALTERNATIVES ELIMINATED FROM DETAILED STUDY

In 1997-98, following the City of Oceanside's rejection of that part of the FEIS/R proposed action which was planned for use of the Oceanside outfall, new alternatives were studied. The alternatives are discussed in detail in the draft report *Marine Corps Base Camp Pendleton Alternative and Regulatory Analysis for Effluent Discharge* (Montgomery Watson 1998). The alternatives analysis is summarized in Table 2-3, including alternatives that were eliminated from detailed study.

Additional sites for ponds within MCB Camp Pendleton, including additional area at Lemon Grove, and sites identified as Rodeo, North Mac, South Mac, I-5/Railroad and Boat Basin, were considered for incorporation into the alternatives to be considered (Figure 2-18). Each of these sites were eliminated from detailed analysis after soils and percolation analyses indicated that adequate percolation rates would not be attainable.

2.4 PERMITTING ISSUES

The following permitting would be required for implementation of the alternatives of the proposed action:

- The proposed discharge of treated effluent at the Lemon Grove ponds would require issuance of State Waste Discharge Requirements from the RWQCB and any other applicable permits as required.

- The proposed discharge of treated effluent to the ground waters of the Santa Margarita River at Ysidora Flats, as proposed in Alternative 3, would require a federal NPDES permit, which would be processed through the RWQCB. A Basin Plan Amendment would also be required.

- The proposed discharge of effluent for purposes of reclamation and irrigation, Alternative 5, would require issuance of State Waste Discharge Requirements from the RWQCB, and written approval by DHS and DEH. Some of the agricultural irrigation would occur east of Interstate 5, and a Basin Plan Amendment would potentially be required if compliance with the Basin Plan Objectives were included in the Waste Discharge Requirements.

- Permits under Sections 401 and 404 of the Clean Water Act would be required for construction of the proposed outfall structure in Ysidora Flats, as described in Alternative 3.

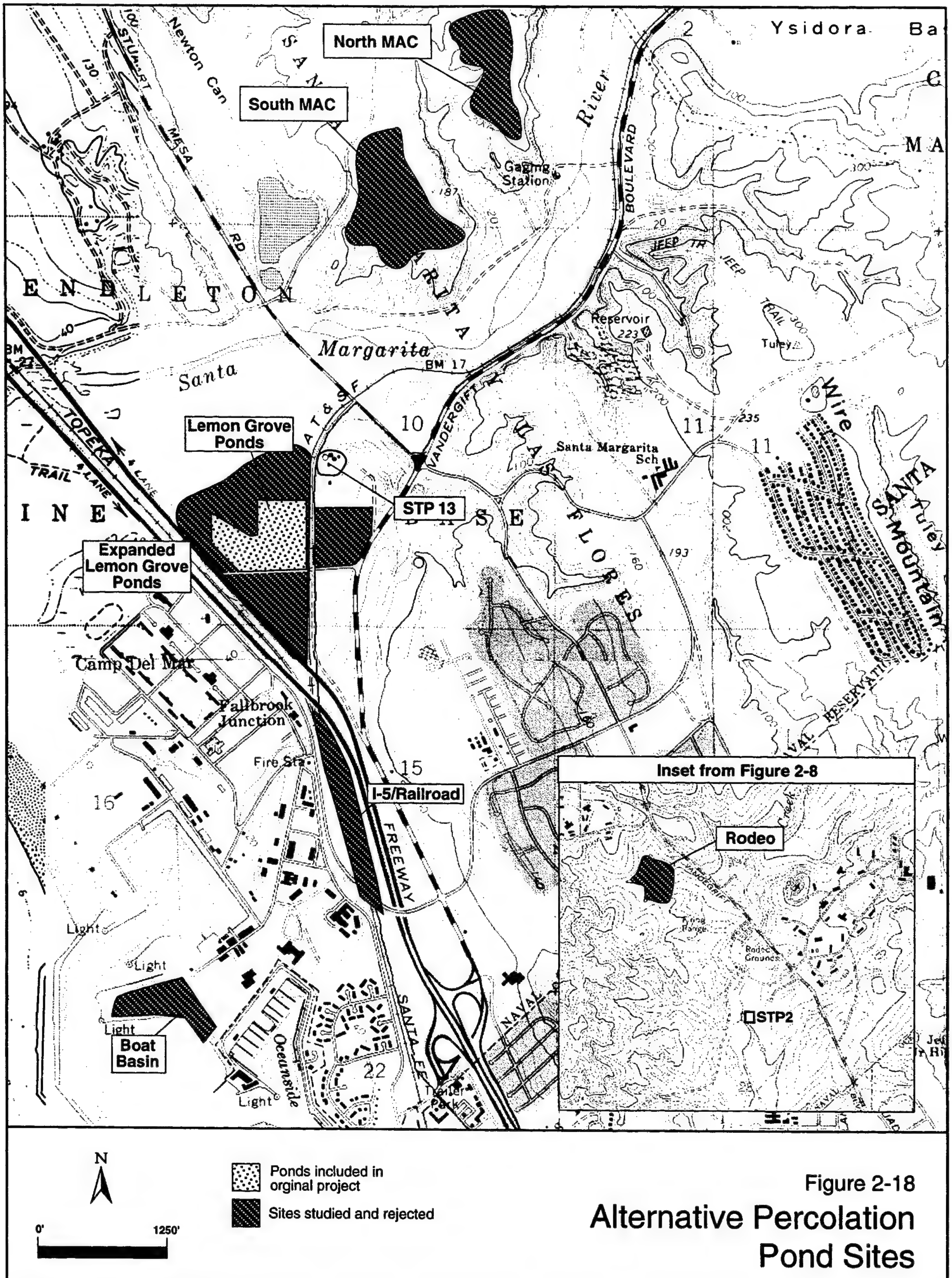


Figure 2-18
Alternative Percolation Pond Sites

9416 P-527/Figures/2-18 Percolation Pond Sites

Table 2-3
Summary of Discharge Options

Discharge Method	Treatment Level	Comments	Conclusion
Percolation	Secondary	Percolation of secondary effluent at the Lemon Grove site would exceed Basin Plan requirements for TDS for the Lower Ysidora Basin - this should be permittable since the site is at the boundary of the basin and the underlying groundwater is saline. Percolation is commonly done with undisinfected secondary, however, high suspended solids in effluent can reduce percolation rate over time.	Considered in detail in Alternatives 1 and 2.
Percolation	Tertiary	Same as above except filtered effluent can help maintain percolation rate over time.	Considered in detail in Alternatives 2, 4 and 5.
Reclamation, Agriculture	Secondary	Existing crop patterns would require tertiary effluent per Title 22 requirements.	Not considered further.[1]
Reclamation	Tertiary	The on-base golf course uses 0.5 MGD (annual average) and on-base agriculture could use approximately 1.5 MGD. Tertiary effluent would be of acceptable quality.	Considered in detail in Alternatives 2 and 5.
Live Stream, year-round	Secondary without nutrient removal	This is the No Action Alternative. Existing conditions are thought to contribute to nutrient loading and excessive algal blooms in the estuary. Permitting would require a Basin Plan amendment and river and estuary monitoring plan.	Considered in the No Action Alternative. Unlikely to be permitted, not considered further.
Live Stream, year-round	Secondary with nutrient removal	It would be technically infeasible to achieve nutrient removal with the trickling filter secondary effluent.	Not feasible, not considered further.
Live Stream, year-round	Partial tertiary with nutrient removal	Significant reduction in nitrogen and phosphorous is technically feasible using biological treatment - this is Best Available Technology (BAT) economically feasible for nutrient removal. Nutrient loading to estuary could create eutrophic conditions. Potential toxicity of effluent (from toxins other than ammonia or chlorine) would be possible. Permitting would require concurrence with Regional Board regarding BAT and implementation of a river/estuary monitoring plan.	Technically feasible, potential to be permitted. Considered in detail in Alternative 3 which proposes blended effluent that provides a secondary level of treatment.
Live Stream, seasonal	Secondary or tertiary without nutrient removal.	In theory, discharge during periods when in-stream flows are high would dilute effluent and ensure that nutrients are carried out to sea and not accumulated in the estuary. Since sufficient base flow is not present in all years, there is an inherent level of unreliability.	Provides a partial solution only. Could be considered in combination with reclamation and seasonal storage.
Estuary, tidal discharge	Secondary or tertiary without nutrient removal	Would minimize the potential for nutrient loading to the estuary depending on success of timed effluent release with falling tides. Potentially feasible, but would require extensive study of the estuary (dye study, microcosm studies, simulation models). Effluent toxicity would have to be evaluated for marine species.	Not considered further since additional studies could not be accomplished within the time schedule.

Discharge Method	Treatment Level	Comments	Conclusion
Ocean, surf zone	Disinfected secondary	Since the nutrient limits are not described west of the I-5 bridge, secondary effluent discharge could be acceptable by Regional Board. Dilution credit would have to be established. Effluent toxicity would have to be evaluated for marine species. Acceptability by DHS and Coastal Commission is uncertain and additional impact analysis would be required. Time necessary for agency/public coordination and impact analysis would exceed the existing compliance schedule.	Not considered further due to schedule constraints.
Ocean, new outfall	Secondary	Technically feasible but would require detailed study to analyze impacts to the marine environment and extensive agency coordination. Effluent toxicity would have to be evaluated for marine species. Estimated costs greatly exceed available funding.	Not considered further due to excessive cost and schedule constraints.
Ocean, Fallbrook	Tertiary	Sublease of 1 MGD of Fallbrook's capacity in the Oceanside outfall. Technically feasible as a partial solution but political negotiations could not be completed within the available time frame. Effluent toxicity would have to be evaluated for marine species.	Not considered further due to schedule constraints.

[1] Secondary effluent is currently used on the golf course, and would continue with Alternatives 1, 3, 4, 5 and the No Action Alternative.

CHAPTER 3.0
AFFECTED ENVIRONMENT

3.0 AFFECTED ENVIRONMENT

The Affected Environment for the environmental resources discussion in Section 3.0 is described in detail in the FSEIS/R. The sections that follow summarize that information, where appropriate, and provide specific information relevant to this FSEIS. Section 3.0 of the FSEIS/R is incorporated by reference in this FSEIS.

3.1 HYDROLOGY AND WATER QUALITY

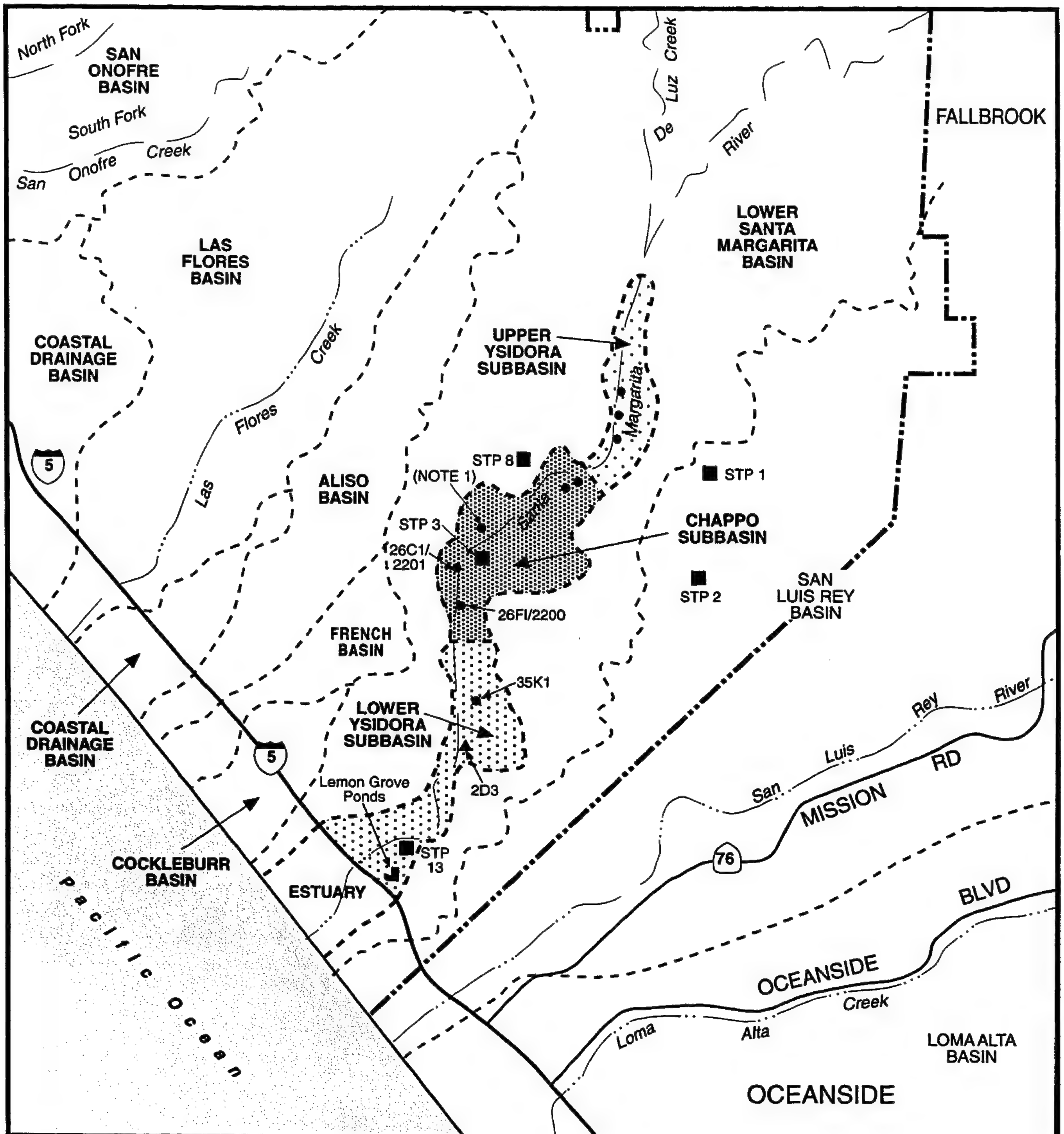
The existing hydrology and water quality of the Lower Santa Margarita Basin are described in the FSEIS/R. Pertinent aspects are summarized below for this FSEIS.

3.1.1 Rainfall, Water Supply Basins, and Water Supply

Annual rainfall along the coastal area near the southern boundaries of MCB Camp Pendleton averages 10 inches. Rainfall in the mountainous areas of the Base averages 20 to 40 inches annually, depending on slope and elevation (U.S. Navy 1992). Most precipitation occurs between November and April, but wide variations can take place in monthly and seasonal precipitation totals. Surface stream flow usually occurs only during the rainy season, but can be perennial within the Santa Margarita drainage.

Topography divides MCB Camp Pendleton into ten distinct watersheds, or basins, four of which are large enough to provide potable and irrigation water supplies to the Base. The proposed action would be located in the southwestern portion of the Lower Santa Margarita Basin, in the area defined in the Basin Plan as the Lower Ysidora Hydrologic Subarea (HSA), which is situated within the larger Ysidora Hydrologic Area (HA) (Figure 3-1).

The Lower Santa Margarita Basin is the most significant water producing basin within MCB Camp Pendleton. The Santa Margarita River traverses the Base four miles before meeting its De Luz Creek tributary. From this point, it then flows through a lush riparian canyon before it widens into a broad flood plain. In some areas, the Santa Margarita River flood plain is more than 2,600 feet wide. The river discharges into a salt water estuary, the Santa Margarita Lagoon, approximately one mile north of Oceanside Harbor. Local runoff flows recharge the basins until they overflow into the ocean. Groundwater movement is relatively slow. Hydraulic conductivities have been recorded to range from less than 25 feet per day to more than 100 feet per day. Surface waters from the basins



Source: MCB Camp Pendleton, 1995.

LEGEND

- BASIN BOUNDARY
- CREEK / RIVER
- CAMP PENDLETON BOUNDARY

WATER SUPPLY WELLS:

- ● POTABLE
- ▲ AGRICULTURAL IRRIGATION
- OUT OF SERVICE

NOTE 1: 2 EXISTING POTABLE AND 2 NEW POTABLE

N

0 3 MILES

Figure 3-1

Lower Santa Margarita Basin Subbasins/Water Supply Wells

9416 P-527/Figures/Figure 3-1 Lower SM Basin

percolate to subsurface layers and prevent seawater intrusion into the groundwater system that, without this barrier, would contaminate the water supply in the basins (MCB Camp Pendleton 1995).

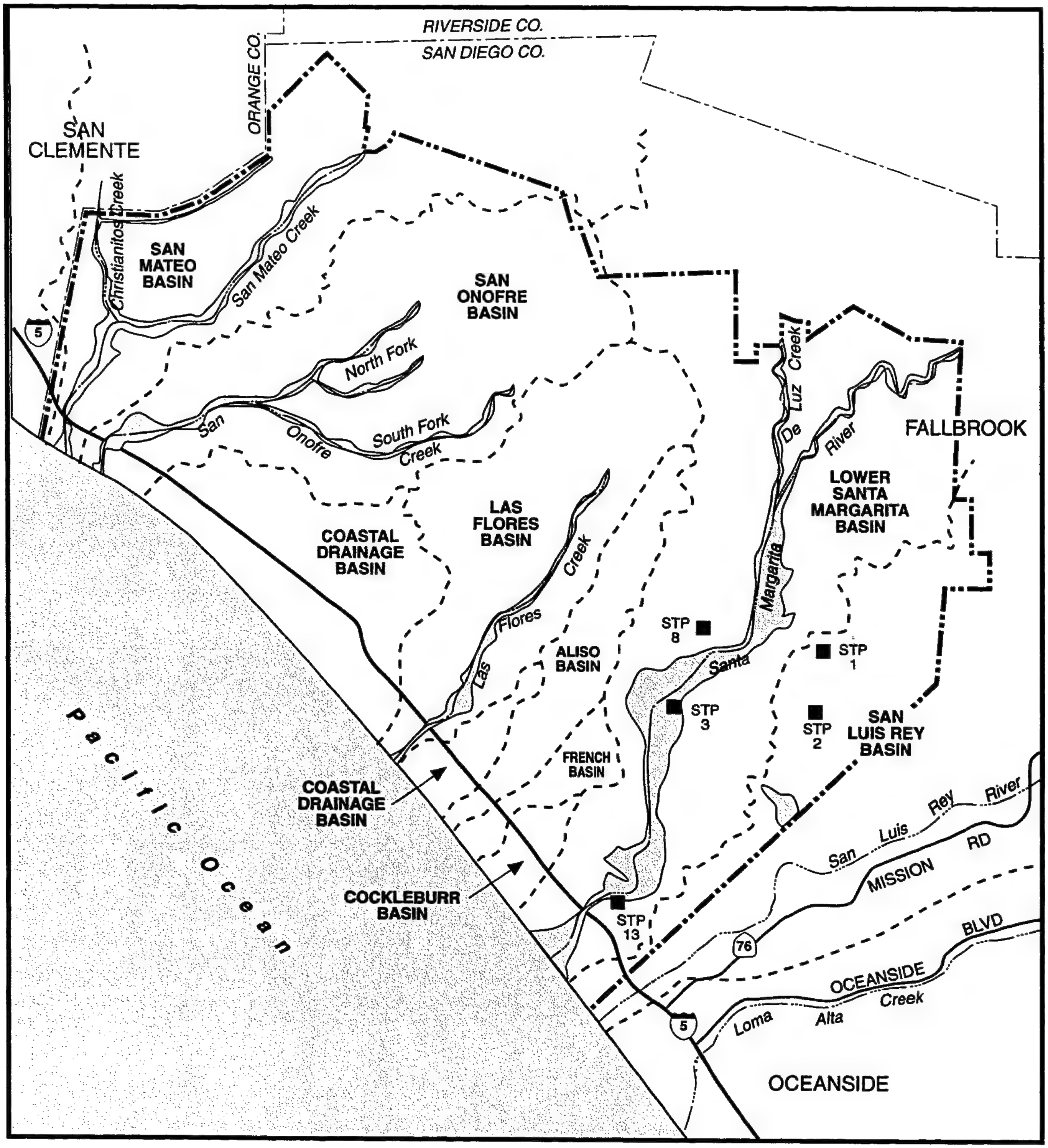
MCB Camp Pendleton derives all its water supply from existing groundwater resources within its boundaries. The Base's residential, military, and agricultural uses are accommodated by this water supply. The Santa Margarita River basin supplies more than 66 percent of all of MCB Camp Pendleton's water. The locations of water supply wells in the Lower Santa Margarita Basin are also shown in Figure 3-1.

Water is supplied to the agricultural fields from two wells, identified as 2D3 and 26F1; Well 26F1 is also known as Well 22-00. These wells do not supply the Base potable water system, and the water from these wells is not treated. Well 35K1, which was formerly used to supply the agricultural fields, is no longer in service. Well 2D3 is approximately 1.4 miles upstream from the Lemon Grove ponds and is the nearest of the three wells. The most southerly well which supplies water to the Base potable water system is Well 23-01, which is approximately 3.7 miles north of the Lemon Grove area.

3.1.2 Flood Plains

Flood plains are relatively flat areas of low lands adjoining the channel of a river, stream, watercourse, bay or other body of water and are subject to inundation during a flood. Most flood plains in southern California are mapped to delineate the area that would be inundated during a storm that has a likelihood, based on historical records, of occurring once in 100 years, or a one percent change of occurring in any given year. These mapped areas are, therefore, referred to as 100-year flood plains. Figure 3-2 depicts the 100-year flood plain boundaries in the region of the proposed action. The 100-year flood boundaries are approximate limits based on historic records and high water marks and are not the result of a detailed hydrologic survey. The Lemon Grove ponds are at elevations above the 100-year flood level. Ysidora Flats, the area of proposed live stream discharge for Alternative 3, is within the Santa Margarita River flood plain.

There were five significant damaging floods between 1916 and 1943 on Base land. More recent flooding has occurred in the years 1951, 1952, 1956, 1968-69, 1978, 1980, 1992-93 and February 1998. Major damage was inflicted on structures, roads, the rail line, STP 3, the oxidation/percolation ponds in the Ysidora Flats area, and other facilities in the Santa Margarita River Basin during the 1978, 1980, 1992-93, and 1998 storms.



LEGEND

- BASIN BOUNDARY
- CREEK / RIVER
- CAMP PENDLETON BOUNDARY
- COUNTY BOUNDARY
- FLOOD PRONE AREA

N

0 3 MILES

Figure 3-2

Drainage Basins and Flood Plains

9416 P-527/Figures/Figure 3-2 Drnges/Fldplns

3.1.3 Existing Discharges in the Project Area

The average daily discharge of secondary treated effluent from STP 13 is currently 1.53 MGD. The effluent is conveyed to the Twin Lakes holding ponds adjacent to STP 13, prior to discharge, and then is conveyed by pipe to the Santa Margarita River flood plain. The release is classified as surface water discharge to the river. As stated in the FSEIS/R, the existing STP 13 discharge adds approximately 300 lbs/day (55 tons per year) of total nitrogen to the Santa Margarita River estuary. The STP 13 discharge also contributes roughly 30 lbs/day (6 tons per year) of phosphorous to the estuary. While the Twin Lakes ponds were not designed for direct recharge, some percolation occurs at the ponds as well as after the effluent is discharged to the river; these flows constitute a small groundwater discharge to the Lower Santa Margarita Basin.

The average daily discharge of secondary treated effluent from STP 3 is currently 0.4 MGD. The effluent is conveyed to a ditch south of STP 3 and approximately 1.5 miles north of the Ysidora Flats area, and is discharged to groundwater. Excess effluent spills from the ditch to the Santa Margarita River flood plain and is a surface water discharge to the river.

Secondary treated effluent from STP 1 is conveyed to a holding pond, and subsequently discharged in the Santa Margarita River Basin west of Vandegrift Boulevard and south of Lake O'Neill. Secondary treated effluent from STP 2 is used for irrigation of the Marine Memorial Golf Course, in the San Luis Rey Basin. Effluent from STP 2 that is excess to the irrigation needs at the golf course is conveyed to the Santa Margarita River Basin, west of Vandegrift Boulevard, in the Ysidora Flats area. Secondary treated effluent from STP 8 is conveyed to a holding pond, and subsequently discharged in the Santa Margarita River Basin, on the west side of the river.

3.1.4 Water Quality Regulations

Water quality issues and permits in San Diego County are regulated by USEPA, USFWS, USACOE, the California DHS, and the California State Water Resources Control Board (SWRCB) through the RWQCB for the San Diego region and the San Diego County Department of Environmental Health (DEH).

Basin Plan

The Basin Plan (RWQCB 1994) provides the regulations designed to protect and preserve water resources in the San Diego area. The Basin Plan designates "beneficial uses" of groundwater and surface water and establishes water quality "criteria" or "objectives" and implementation programs

necessary to achieve these water quality objectives. These beneficial use designations and water quality criteria/objectives are legally enforceable water quality standards.

Table 3-1 summarizes Basin Plan groundwater quality objectives of the Ysidora HA. The Basin Plan does not establish groundwater quality objectives west of the eastern boundary of I-5. The designated beneficial uses for groundwater are municipal supply, agricultural supply, industrial service supply, and industrial process supply. These beneficial uses do not apply to basin areas west of I-5. The Lemon Grove site is located adjacent to, and east of, this boundary.

Table 3-1
Basin Plan Groundwater Quality Objectives Ysidora Hydrologic Area

		Groundwater Quality Objective	
Constituent	**Units**	**Easterly of the Easterly Boundary of Interstate 5**	**Westerly of the Easterly Boundary of Interstate 5**
TDS	mg/l	750[1]	None
Chloride	mg/l	300[1]	None
Sulfate	mg/l	300[1]	None
Percent sodium	%	60	None
Nitrate	mg/l	10[1]	None
Fluoride	mg/l	1.0	None
Iron	mg/l	0.3[1]	None
Manganese	mg/l	0.05[1]	None
MBAS	mg/l	0.5	None
Boron	mg/l	0.75[1]	None
Odor	NA	None	None
Turbidity	NTU	5	None
Color	units	15	None

[1] The recommended plan would allow for measurable degradation of groundwater in the basin to permit continued agriculture land use. Point sources, however, would be controlled to achieve effluent quality corresponding to the tabulated numerical values. In future years, demineralization may be used to treat groundwater to the desired quality prior to use.

mg/l = milligrams per liter; NA = not applicable; NTU = turbidity units

There are no designated beneficial uses of inland surface waters of the Ysidora HA. The inland surface water quality objectives for the Ysidora HA are shown in Table 3-2. The designated beneficial uses of the Santa Margarita Lagoon are contact water recreation; non-contact water recreation; estuarine habitat; wildlife habitat; rare, threatened or endangered species habitat; marine habitat; and, migration of aquatic organisms.

Table 3-2
Basin Plan Inland Surface Water Quality Objectives, Ysidora Hydrologic Area

Constituent	Units	Objective
TDS	mg/l	750
Chloride	mg/l	300
Sulfate	mg/l	300
Percent sodium	%	60
Nitrogen & Phosphorous	mg/l	Footnote 1
Fluoride	mg/l	1.0
Iron	mg/l	0.3
Manganese	mg/l	0.05
MBAS	mg/l	0.5
Boron	mg/l	0.75
Odor	–	None
Turbidity	NTU	20
Color	Units	20

1 Concentrations of nitrogen and phosphorus, by themselves or in combination with other nutrients, shall be maintained at levels below those which stimulate algae and emergent plant growth. Threshold total Phosphorus (P) concentrations shall not exceed 0.05 mg/l in any stream at the point where it enters any standing body of water, nor 0.025 mg/l in any standing body of water. A desired goal in order to prevent plant nuisances in streams and other flowing waters appears to be 0.1 mg/l total P. These values are not to be exceeded more than 10% of the time unless studies of the specific body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1 shall be used.

Groundwater and Surface Water Discharge Permits

The RWQCB issues NPDES permits, which are federal permits for discharges of pollutants, including reclaimed water, to waters of the United States. The RWQCB also issues Waste Discharge Requirements, which are state permits for waste discharges to land or water, affecting the quality of waters of the state. NPDES permits also function as Waste Discharge Requirements. The RWQCB commonly consults with local, state, and federal agencies, such as wildlife agencies, in the issuance of permits.

On August 11, 1994, Order No. 94-51 (NPDES CA0108863), *Waste Discharge Requirements for the United States Marine Corps Camp Pendleton Five Wastewater Treatment Facilities Discharging Treated Waste in the Santa Margarita River Watershed, San Diego County,* was issued. This permit includes STPs 1, 2, 3, 8, and 13. Order 94-51 recognized the FSEIS/R proposed action, which would

have conveyed treated effluent by pipeline to the City of Oceanside ocean outfall. Order No. 94-51 regulates the discharge from the five STPs ". . . until such time that the proposed pipeline to the ocean outfall is constructed." The City of Oceanside's disapproval of the proposed agreement to provide MCB Camp Pendleton access to excess capacity within the City's ocean outfall requires modification of this permit.

Additional federal and state laws relative to water quality include the following:

- Federal Clean Water Act of 1977 (33 U.S.C. § 1251 (1994));
- Federal Safe Drinking Water Quality Act of 1979 (42 U.S.C. § 300f (1994));
- State of California Porter-Cologne Water Quality Act (Cal. Water code §§ 13000-13999.10); and,
- California Safe Drinking Water and Toxic Enforcement Act (1986).

These laws are described in the FSEIS/R, Appendix A.

3.1.5 <u>Water Quality</u>

The current water quality of the STP 1, 2, 3, 8, and 13 effluents is not acceptable for surface discharge. As described in Section 1 of this FSEIS, the quality of the STP effluents has exceeded the limits established by the NPDES permits for surface water discharge, and Cease and Desist Order No. 94-52 is currently in effect for all five STPs.

Toxicity testing using effluent from each of the five STPs (1, 2, 3, 8, and 13) was conducted with fathead minnows, *Ceriodaphnia* and *Selenastrum*. Data from 1994 through 1996 indicated that effluent from STP 8 appeared to be fundamentally nonimpactive to the species tested. STPs 1 and 2 had moderate toxicity and STPs 3 and 13 exhibited more serious toxicity at lower test concentrations. Additional testing in 1997 indicated some chronic toxicity in excess of the 1.0 toxicity unit (TU) limit for each of the five treatment plants. These results suggest that effluent from the five STPs would likely not reliably pass the toxicity testing required as part of a new NPDES permit. A Toxicity Identification Evaluation (TIE) is currently being conducted for MCB Camp Pendleton using freshwater species and effluent from STPs 3 and 13. The TIE seeks to identify by sequential evaluations the source(s) of toxicity so that they may be addressed. Typical sources of toxicity in wastewater are residual chlorine, ammonia, heavy metals, hydrocarbons, and organic compounds such as pesticides (Montgomery Watson 1998).

The quality of the Santa Margarita River water varies. A sample was taken in April 1995 at the Basilone Road bridge. This point is upstream of the discharges of STPs 1, 8, 3, and 13. Data from that sample is shown in Table 3-3; all values were within Basin Plan Objectives. Examination of earlier (1994) data shows Basin Plan objectives were exceeded for TDS and phosphates.

Table 3-3
Santa Margarita River Water Quality

Constituent	Units	Basin Plan Objective[1]	Sample Data 4/11/95
TDS	mg/l	750	548
Chloride	mg/l	300	107
Percent Sodium	%	60	<56[2]
Sulfate	mg/l	300	120
Nitrogen and Phosphorous		Footnote 3	
Fluoride	mg/l	1.0	0.4
Iron	mg/l	0.3	0.255
Manganese	mg/l	0.05	0.023
Boron	mg/l	0.5	0.099
MBAS	mg/l	0.5	<0.05
Turbidity	NTU	20	8.5
Color	units	20	11
Odor		none	<1 unit

[1] Water quality objectives for inland surface waters for the Ysidora HA. Concentrations not to be exceeded more than 10% of the time during any one-year period.
[2] %Na = Na/(Na + CA + Mg + K). No analysis for potassium was performed.
[3] Concentrations of nitrogen and phosphorus, by themselves or in combination with other nutrients, shall be maintained at levels below those which stimulate algae and emergent plant growth. Threshold total Phosphorous (P) concentrations shall not exceed 0.05 mg/l in any stream at the point where it enters any standing body of water, or 0.025 mg/l in any standing body of water. A desired goal in order to prevent public nuisances in streams and other flowing waters appears to be 0.1 mg/l total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the RWQCB.

Waters in the Santa Margarita River estuary are influenced by ocean tides up to one-half mile inland from I-5, including the zone underlying the Lemon Grove site, located east of I-5, which contains groundwater that is highly saline. Given tidal influences and the proximity of the site to the coast, concentrations of TDS in groundwater currently beneath the site are likely to exceed 20,000 mg/l.

Because of this poor groundwater quality and sea water intrusion, no wells currently exist at or near the Lemon Grove site. The U.S. Geological Survey (1954), however, identified several historic wells in the general vicinity of the Lemon Grove pond site. Table 3-4 summarizes water quality samples collected in the early 1950s from these wells. As shown in the table, groundwater quality

Table 3-4
Summary of Groundwater Quality
Vicinity of Proposed Percolation/Equalization Pond[1]

Well No.	Approximate Location	Status of Well	Approximate Date of Sample	Total Dissolved Solids Concentration (mg/l)
11S/5W-9J1	Adjacent to old Highway 101 within 500 feet of proposed percolation pond site	Destroyed	1951	36,100[2]
11S/5W-2N4	Lower Ysidora Narrows at downstream end of Lower Ysidora basin, approximately 1 mile upstream from percolation pond site	Destroyed	1951	9,030[3]

[1] From U.S. Geological Survey (1954)
[2] Concentrations for other constituents in the sample included 577 mg/l calcium, 1,420 mg/l magnesium, 11,000 mg/l sodium, 20,300 mg/l chloride, and 2,380 mg/l sulfate.
[3] Concentrations for other constituents in the sample included 480 mg/l calcium, 289 mg/l magnesium, 2,500 mg/l sodium, 2,500 mg/l chloride, and 602 mg/l sulfate.

during the 1950s in the Lemon Grove area was extremely poor. (The recorded water quality at Well No. 11S/5W-9J1 is more saline than ocean water.) Because of this poor water quality, wells in and downstream from the Lower Ysidora narrows have been closed by MCB Camp Pendleton.

Leedshill Herkenhoff (1988) and NBS/Lowry (1989) presented a detailed summary of groundwater quality in the Lower Ysidora Basin, and described two wells located in the middle portion of the Lower Ysidora Basin. Well No. 11W/5S-2A3 is located above the Lower Ysidora Narrows in the Lower Ysidora groundwater basin. Concentrations of TDS in Well 11W/5S-2A3 have historically averaged 1,000 mg/l, and have ranged from 1,200 mg/l to 700 mg/l. Well No. 11W/5S-2D3 (2D3) produced irrigation water with somewhat similar mineral characteristics. Almgren & Koptionak (1989) reported water quality of irrigation water used for the irrigation of the agricultural fields near Stuart Mesa. The data, from 1983, is shown in Table 3-5. Of these three, Wells 2D3 and 26F1/22-00 currently provide irrigation water. With the exception of Well No. 26F1/22-00, all of the other above data indicate that existing groundwater TDS concentrations exceed the Basin Plan objective of 750 milligrams per liter from the ocean upstream to the upper reaches of the Lower Ysidora subbasin.

Table 3-5
Chemical Quality Analysis of Water Samples From Wells 2D3, 35K1, and 26F1/22-00

Constituent[1]	2D3	35K1	26F1/22-00
Date Sampled	11/13/83	12/14/83	12/13/83
Calcium	120	110	80
Magnesium	43	36	27
Sodium	182	176	126
Potassium	5	4	3
Carbonate	None	None	None
Bicarbonate	360	378	268
Chloride	212	250	149
Sulfate	267	151	135
Nitrate	<1	<1	<1
Nitrate-N	<0.3	<0.3	<0.3
Boron	0.3	0.5	0.4
Fluoride	0.5	0.5	0.6
Iron	0.2	2.1	0.2
Manganese	0.45	0.36	0.32
Total Hardness (as $CaCO_3$)	475	410	310
Total Dissolved Solids (Summation)[2]	1,038	942	678
ph (units)	7.5	8.2	8.0
Electric Conductivity (micromhos/cm)	1,560	1,524	1,125
Sodium Adsorption Ratio (SAR)	3.6	3.6	3.1
Percent Sodium	45	48	47
Recommended Gypsum Application (Pounds of 100% Pure Gypsum or Equivalent Per Acre-Foot of Water)	1,006	1,334	866

[1] Units in milligrams per liter unless otherwise noted.
[2] Determined by Stetson Engineers Inc. based upon USGS method.
Source: Almgren & Koptionak, 1989.

3.2 CULTURAL RESOURCES

3.2.1 Introduction

Cultural resource investigations included an inventory and evaluation program of the proposed action and alternatives. The goal of this effort was to identify all cultural resources within the study areas and determine if these resources are eligible for nomination to the National Register of Historic Places (National Register). The pond sites at Lemon Grove, the Ysidora Flats area, the equalization basin site, the AWT facility site, the proposed pipeline segments not in existing roadways, and the existing STP 2 site all comprise the study area for this proposed action. This information provided the basis for the assessment of impacts to significant cultural resources (those eligible for the National Register) that is included in Section 4.2. This effort is mandated by NEPA and the National Historic Preservation Act (NHPA), and their respective implementing regulations and guidelines. The action is a federal undertaking with MCB Camp Pendleton as federal lead agency for NHPA compliance.

Archaeological resources are prehistoric and historic sites, districts, or any other physical evidence of human activity considered significant to a culture, a subculture, or a community for scientific, traditional, religious, or any other reasons. Typical prehistoric archaeological resources are campsites, lithic material procurement sites, and food processing areas, while typical historic resources are early house sites and historic refuse areas. Archaeological resources, both prehistoric and historic, and historic standing structures 50 years or older, are commonly called cultural resources, but when determined eligible for nomination to the National Register, are referred to as historic properties under federal law.

3.2.2 Background

The following brief prehistoric and historic background provides a context for understanding archaeological and historical resources in the region of the Proposed Action.

Prehistory

Paleoindian Period

Prehistoric people can be classified in a variety of ways. Recent studies in the region have focused on the sequence of Native American economic development. The earliest well-documented prehistoric sites in southern California are classified within the Paleoindian Period, which has locally

been termed the San Dieguito complex/tradition. In this region, the Paleoindian period is thought to have occurred between 9,000 years ago (or earlier) and 8,000 years ago. Although varying from the well-defined fluted point Paleoindian complexes of the Great Plains, the San Dieguito tradition still features a hunting-focused economy with limited use of seed grinding technology. Archaeological evidence associated with this period has been found around dry inland lakes, on old terrace deposits of the California desert, and also along the coast where it was first documented at the Harris Site (near Lake Hodges).

Debate continues as to whether these people continued to occupy San Diego County or abandoned the region 8,000 years ago. According to both scenarios, the early occupants made use of coastal and inland resources of plants, animals, shellfish, and fish. Evidence of Paleoindian occupation in the immediate vicinity of the project is limited. Much of the coastal Paleoindian evidence has been covered by rising sea levels and alluvial sedimentation in valley areas. Evidence from this period has been preserved on some of the Channel Islands, however, and at isolated sites along the California coast.

Archaic Period

Native Americans during the Archaic period had a generalized economic strategy based on hunting and gathering. In many parts of North America, Native Americans later replaced this economy with types based on horticulture and agriculture. Coastal southern California economies, however, remained largely based on wild resource use until European contact. Changes in hunting technology and other important elements of material culture have created two distinct subdivisions within the Archaic period in southern California. These are termed the Early and Late Archaic periods.

The Early Archaic period is differentiated from the earlier Paleoindian Period by a shift to a more generalized economy and an increased focus on the use of grinding and seed processing technology. At sites dated between approximately 8,000 and 1,500 years before present (B.P.), the increased use of groundstone artifacts and atlatl dart points, along with a mixed core-based tool assemblage, identify a range of adaptations to a more diversified set of plant and animal resources. Variations of the Pinto and Elko series projectile points, large bifaces, manos and portable metates, core tools, and heavy use of marine invertebrates in coastal areas are characteristic of this period but many coastal sites show limited use of diagnostic atlatl points. Major changes in technology within this relatively long period of time appear limited. Several scientists have considered changes in projectile point styles and artifact frequencies within the Early Archaic period to be indicative of population movements or units of cultural change. These units have been poorly defined in the local area due to poor site preservation.

The Late Archaic period represents a continued focus on hunting and gathering of natural resources. It is separated from the Early Archaic by a series of major technological shifts including the introduction of the bow and arrow, cremation burial practices, and ceramics. The period extends from approximately 1,500 years B.P. to European contact. The changes in technology were introduced either by migrating peoples from the east, moving into the area and bringing their own cultural traits with them, or through cultural diffusion from contact with Native Americans to the east. Other cultural traits associated with these people include elaborate kinship systems, clan systems, rock art, and trading networks.

Ethnohistoric Period

The Ethnohistoric period refers to the brief period when Native American culture was initially being affected by Euroamerican culture and historical records focusing on Native American activities were limited. It thus represents a transition period between the prehistory and history of the area. When Spanish colonists began to settle California, the Camp Pendleton area was within the territory of a loosely integrated cultural group historically known as the Luiseño. They were called the Luiseño because of their association with the San Luis Rey Mission. The Luiseño speak a Takic language which links them with the Gabrieliño to the north and Cahuilla and Cupeño to the northeast and east, and differentiates them from the Kumeyaay, who speak a Yuman language, to the south.

The Luiseño further see themselves divided into three regional groups which included differences in culture and language dialect. One of these groups, associated with the San Juan Capistrano Mission and called Juaneño, has often been considered a separate cultural unit from the other two groups of Luiseño. European contact introduced disease that dramatically reduced the Native America population and helped to break down cultural institutions. The transition to largely a Euroamerican lifestyle occurred relatively rapidly in the 19th Century.

History

European exploration and settlement changed forever the Native American culture and landscape. Spanish military and religious contingents began settling the region in 1769, establishing a series of missions and presidios in California. The Mexican revolution changed the political status of the region, fostering a large hide and tallow industry. The mission system that was critical to the initial European settlement of the area was secularized in 1844 and lands were divided into private ranchos. The rancho system reached its peak during this period. The Mexican-American war resulted in control of California by the United States, and the discovery of gold in 1849 led to increased settlement.

Historical activity in the project area initially focused on the Santa Margarita Ranch, Guajome Ranch, and the San Luis Rey Mission. The mission area and surrounding valley developed into an agricultural community in the mid to late 1800s. The location of the railroad along the coast in the late 1800s shifted the focus of community activity from the mission area to the coast. Speculators, led by Andrew Myers, subdivided the coastal bluff along the railroad and established the City of Oceanside.

3.2.3 Cultural Resource Inventory Results

A draft technical report summarizing the inventory results was prepared for this proposed action (York 1998). A search of recorded sites revealed that a total of 35 archaeological sites and five isolated finds have been recorded within one mile of the study areas. Most of these are located on Stuart Mesa and other terraces surrounding the Santa Margarita River, and most consist of scatters of prehistoric and historic artifacts and shell (Table 3-6). None of the sites are recorded within the Lemon Grove pond area, the AWT plant site, the Ysidora Flats area or STP 2.

Some of the sites identified in Table 3-6 are located along the pipeline corridor from STP 13 to Ysidora Flats, and were identified during the evaluation of cultural resources for the FSEIS/R. Therefore, during the 1997-1998 installation of pipeline along this corridor, a cultural resources monitoring program was conducted, and significant resources were identified. Mitigation measures were implemented as required to avoid significant impact.

Lemon Grove Study Area

Intensive survey of the Lemon Grove study area revealed no historic or prehistoric cultural resources, a finding consistent with previous investigations on this parcel (Clevenger et al. 1992; Welch 1975).

AWT Plant Study Area

The study area for the AWT facility is located on top of the terrace immediately east of STP 13 and the base recycling center. Measuring about 350 feet by 400 feet (3.2 acres), this area is covered with grass and sage scrub, with evidence of substantial disturbance by heavy equipment. Intensive survey of the AWT study area revealed no prehistoric or historic cultural resources.

Table 3-6
Previously Recorded Cultural Resources within 1 Mile of Study Areas

Site Numbers				
SCIC*	SDMOM**	Site Description	Date	Project Area
CA-SDI-4415		Shell scatter	1975	Ysidora Basin
CA-SDI-4416		Shell scatter/lithic scatter milling	1975	Ysidora Basin
CA-SDI-4417		Habitation site	1975	Ysidora Basin
CA-SDI-4423/H	W-2420	Lithic scatter/historic debris	1995	STP 13
CA-SDI-4424		Temporary camp	1995	STP 13
CA-SDI-4425	W-5337	Shell midden/lithic scatter	1995	STP 13
CA-SDI-4426		Shell scatter	1995	STP 13
CA-SDI-4427		Shell scatter/lithic scatter	1975	STP 13
CA-SDI-4544		Unknown	--	STP 13
CA-SDI-4545		Shell scatter	--	STP 13
CA-SDI-6049	W-1864	Lithic scatter	--	STP 2
CA-SDI-6907		Bedrock milling	1979	STP 2
CA-SDI-6908		Temporary camp, rock art	1979	STP 2
CA-SDI-8725		Bedrock milling	1980	STP 2
CA-SDI-8761/H		Shell/lithic scatter, historic debris	1992	STP 13
CA-SDI-8778	W-2226	Bedrock milling	1980	STP 2
CA-SDI-10,226/H	W-3557	Historic debris	1995	STP 13
CA-SDI-12,100	W-4950A	Temporary camp	1991	STP 2
CA-SDI-12,101	W-4951A	Habitation site	1991	STP 2
CA-SDI-12,102	W-4951B	Temporary camp	1991	STP 2
CA-SDI-12,103	W-4952	Lithic scatter	1991	STP 2
CA-SDI-12,568	W-4964A	Temporary camp with shell	1992	Ysidora Basin
CA-SDI-12,569	W-4964B	Habitation with shell	1992	Ysidora Basin
CA-SDI-12,572	W-4967A	Shell scatter/lithic scatter	1992	STP 2
CA-SDI-12,577	W-4964D	Temporary camp with shell	1992	Ysidora Basin
CA-SDI-12,631	W-5013	Lithic scatter	1995	STP 13
CA-SDI-12,632	W-5014	Lithic and shell scatter	1995	STP 13
CA-SDI-13,929		Shell scatter/lithic scatter	1995	STP 13
CA-SDI-13,930		Shell scatter/lithic scatter	1995	STP 13
CA-SDI-13,933		Shell scatter/lithic scatter	1994	STP 13
CA-SDI-13,940		Shell scatter	1995	STP 13
CA-SDI-14,005H		Rail road track	1994	Ysidora Basin
CA-SDI-14,006H		El Camino Real	1994	Ysidora Basin
I-316		Unknown	1991	STP 2
I-411	W-4962	Metavolcanic core tool	1992	STP 2
I-412	W-4964C	Flakes	1992	Ysidora Basin
I-415	W-4967B	Metavolcanic core	1992	STP 13
I-419		Metavolcanic core tool	1992	STP 13
SS-2		Unknown	--	--
SS-3		Unknown	--	--

* South Coastal Information Center
** San Diego Museum of Man

Ysidora Flats Area

The Ysidora Flats area, from west of Vandegrift Boulevard to the Santa Margarita River, was heavily disturbed in late 1997 as part of a wetlands restoration project. No prehistoric or historic cultural resources have been identified in this area.

STP 2 AWT Plant Site

The STP 2 site is located within the existing fenced area for STP 2. This site was included in the Area of Potential Effect (APE) and survey area for the FSEIS/R. The point of connection with the STP 1 effluent pipeline across Pilgrim Creek was also included in the APE and survey area for the FSEIS/R. No prehistoric or historic cultural resources have been identified in either of these areas.

STP 13 to Ysidora Flats Pipeline Corridor

As described above, significant cultural resources were identified along this corridor prior to and during construction of the existing pipeline.

3.3 BIOLOGICAL RESOURCES

Information in this section of the FSEIS is summarized from the Supplemental Biological Technical Report, Appendix B.

3.3.1 Survey Methods

Data Sources and References

Background information for this document stems from the original FSEIS/R for the Santa Margarita Sewage Effluent Treatment Project (1997), and the following two U.S. Army Corps of Engineers (USACOE) permit documents: Section 404 Permit File # 96-000067-ES, February 25, 1997 (BRAC project permit); and, Section 404 Permit File # 96-00129-ES, April 6, 1998 (Levee project permit). The BRAC project is the realignment to MCAS/MCB Camp Pendleton; the Levee project is the combination of the Santa Margarita River Flood Control Project (P-010) and the Basilone Road Bridge Replacement Project (P-030).

Ysidora Flats was surveyed in 1992 as part of this initial project. Information on this site was evaluated based on existing biological information within the appendices of the original P-527B FSEIS/R as well as current aerial photographs of the site. Additionally the BRAC Wetlands Mitigation Project report (Tierra Data Systems 1997) was used to evaluate existing conditions of the Ysidora Flats site. The AWT Facility/Equalization Basin site and STP 2 were surveyed on foot.

Survey Methods and Limitations

The study area was surveyed for the presence of sensitive species on December 23 and 29, 1997; March 11 and September 15, 1998. Sensitive species are those listed by the federal and state government and other wildlife monitoring agencies. The field investigation included a general biological site reconnaissance and identification of potential habitat for sensitive species. Biological resources were mapped in the field using 1:2,400 scale topographic Base maps of the project area issued by Camp Pendleton Public Works Office. The biological resources were also evaluated based on existing biological information within the appendices of the original P-527B FSEIS/R and data sources for the project vicinity (i.e., Camp Pendleton mapping and the California Natural Diversity Data Base "Rarefind").

Plant species were identified by direct observation. Animal species were identified by both direct observation and indirect sign (i.e., scat, tracks, calls, nests, and burrows). Scientific nomenclature used throughout this report conforms to Hickman, ed. (1993) and Skinner and Pavlik (1994) for plants, Holland (1986) for vegetation communities, and Laudenslayer et al. (1991) for wildlife.

All plant species encountered during the botanical surveys were identified in the field or sampled and identified in a laboratory setting. A floral inventory that includes all plant species detectable during the late fall/early winter survey period was compiled and is included in the Supplemental Biological Technical Report in Appendix B.

Wildlife surveys consisted of walking meandering transects through the various habitats within the focused study area. A wildlife species inventory was compiled for species encountered during the surveys and is included in Appendix B. Least Bell's vireo (*Vireo bellii pusillus*), and southwestern willow flycatcher (*Empidonax traillii extimus*) data were acquired from Griffiths 1997, coastal California gnatcatcher (*Polioptila californica californica*) data from Griffiths 1994, and arroyo southwestern toad (*Bufo microscaphus californicus*) data from Holland 1997. Information about the Quino checkerspot butterfly (*Euphydryas editha quino*) was gathered from Redak et al. (1997) and Riverside fairy shrimp (*Streptocephalus woottoni*) and San Diego fairy shrimp (*Branchinecta sandiegoensis*) map data were obtained from MCB Camp Pendleton's digital files.

3.3.2 Environmental Setting

The topography and soil types within the four sites (discussed below) varies considerably, since they are non-contiguous areas situated throughout the southwest portion of MCB Camp Pendleton.

The AWT Facility site consists of a generally flat mesa adjacent to the east side of STP 13, and northwest of the Recycling Center. The equalization basin site occurs on the same mesa just south of the recycling center and north of the Base's Commissary. The elevation of these sites ranges from approximately 40 to 45 feet above Mean Sea Level (MSL). The soils of both sites are sandy loams of the Visalia series (USDA 1973). The Ysidora Flats site is located within the floodplain of the Santa Margarita River. The elevation of the site ranges from 25 to 30 feet above MSL. Greenfield sandy loams and Salinas clay are the soils onsite (USDA 1973). STP 2 occurs on the slopes above and to the west of Pilgrim Creek. The elevation of the site ranges from approximately 100 to 140 feet above MSL. Bonsall sandy loams and Tujunga sand are the soils onsite (USDA 1973).

3.3.3 Description of Biotic Resources

Vegetation Communities

Vegetation types or communities and plant associations are assemblages of plant species that usually coexist in the same area. The existing plant associations occurring within and adjacent to the focused study area consist of the following community types: Diegan coastal sage scrub, southern willow riparian forest; southern willow scrub; mule fat scrub; southern coastal salt marsh disturbed wetlands; non-native annual grassland; ruderal habitat; eucalyptus woodland/exotic trees; and, developed/ornamental areas. These plant associations are generally described below and are shown in Figures 3-3 through 3-5.

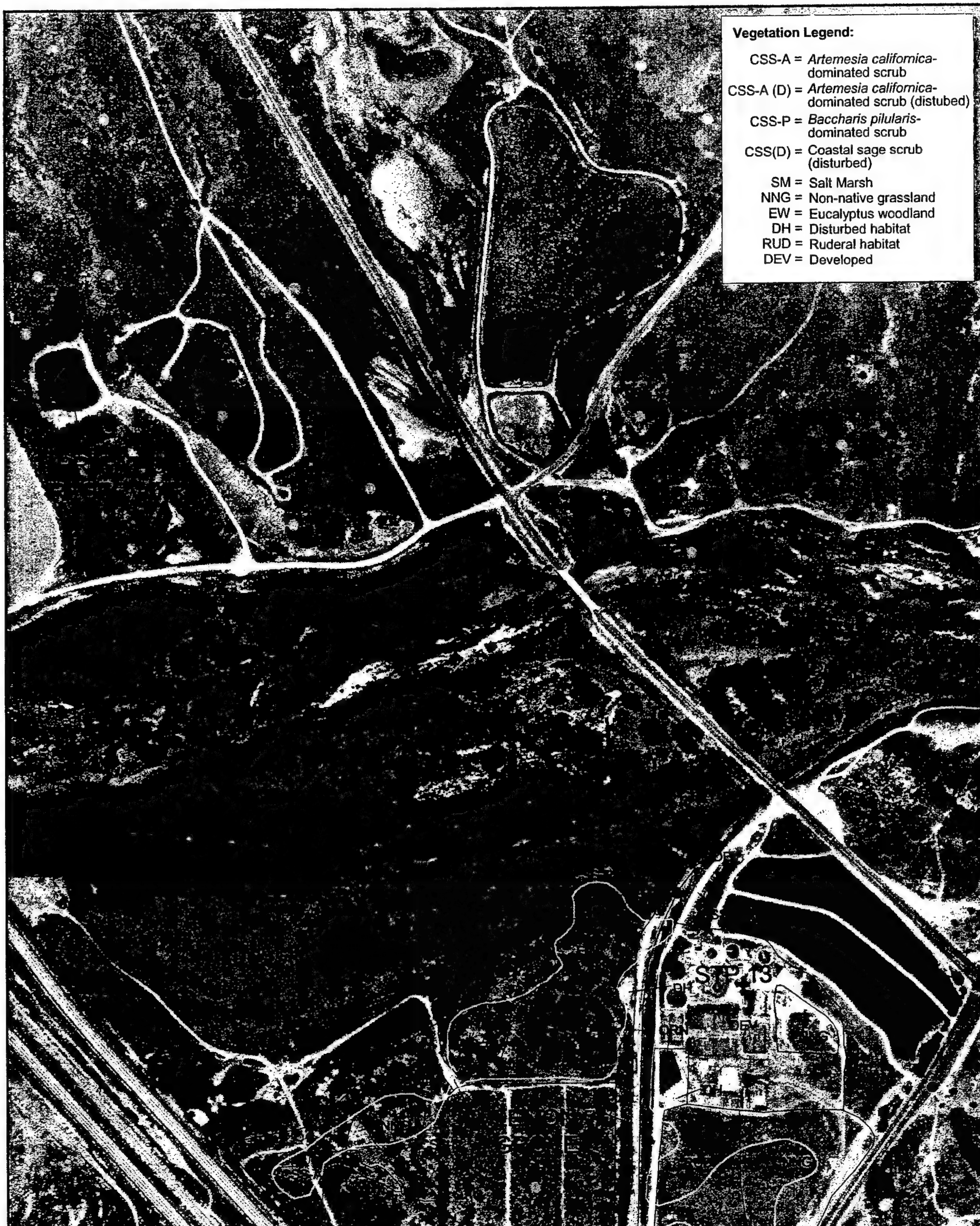
Upland Communities

Diegan Coastal Sage Scrub

Coastal sage scrub is one of the major shrub-dominated (scrub) communities within California. This community occurs on dry sites with shallow soils. Sage scrub species are typically drought deciduous plants with shallow root systems. Both of these adaptations allow for the occurrence of sage scrub species on xeric sites.

There are four floristic associations within the coastal sage scrub formation, all occurring within distinct geographical ranges along the California coast. The Diegan association occurs from Orange County to northwestern coastal Baja California (O'Leary 1990). Oberbauer (1996) recognizes coastal and inland forms of this association.

Diegan coastal sage scrub may be dominated by a variety of different species depending upon site-specific topographic, geographic, and soil conditions. Within San Diego County, there are several recognized sub-associations of Diegan coastal sage scrub, with classifications based upon the dominant species. California sagebrush (*Artemisia californica*) dominated sage scrub and disturbed coastal sage scrub occur along the bluffs, north and northwest of the Lemon Grove percolation ponds. Other species that were observed to be common within these sub-types include coastal goldenbush (*Isocoma menziesii* var. *vernonoides*), laurel sumac (*Malosma laurina*), Mexican elderberry (*Sambucus mexicana*), coastal prickly pear (*Opuntia littoralis*), and cane cholla (*Opuntia parryi* var. *parryi*).



Source: Base Aerial Coverage: Southwest Division
Vegetation Communities: KEA Environmental (1997-98)
SWWF and LBV Data: 1997 Griffith Data

300 0 300 600 900 Feet

Sensitive Species
- Least Bell's Vireo Sighting
- Southwest Arroyo Toad Sighting
- Gnatcatcher Sighting (1994)
- Gnatcatcher Sighting (1997)

Vegetation Community Boundary
Survey Route

Figure 3-3

Vegetation & Sensitive Species for Lemon Grove

9416.6 P-527/GIS/9416.6 P-527 (Latest)/Figure 3.apr

Source: Base Aerial Coverage: Southwest Division
Vegetation Communities: P-527 FEIS/R, 1997
SWWF and LBV Data: 1997 Griffith Data

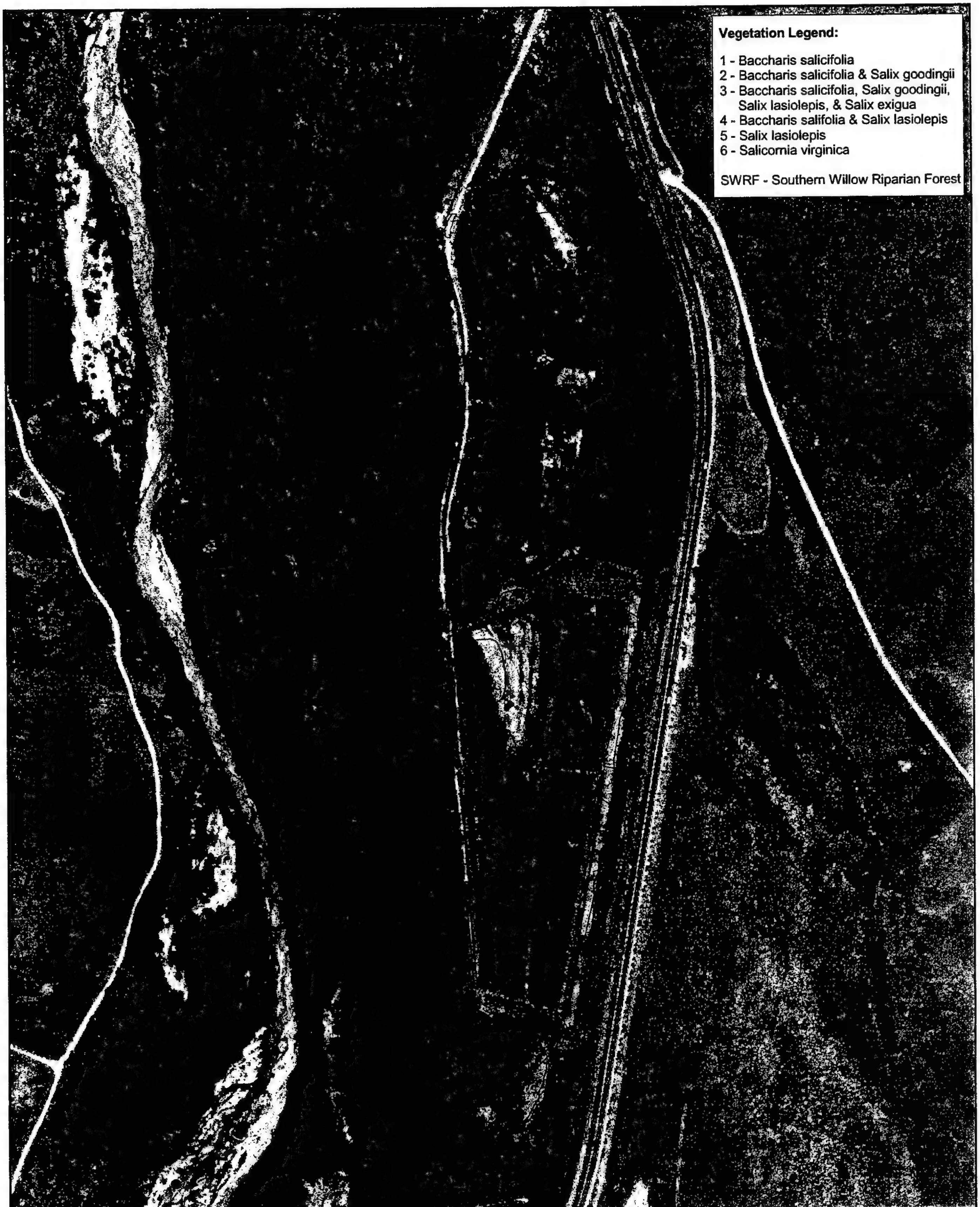
200 0 200 400 600 Feet

Sensitive Species
- Least Bell's Vireo Sighting
- Southwestern Willow Flycatcher Sighting
- California Gnatcatcher Sighting (1994)
- California Gnatcatcher Vocalization (1998)

Vegetation Community Boundary

Figure 3-4
Vegetation & Sensitive Species for STP 2

9416.6 P-527/GIS/9416.6 P-527 (Latest)/Figure 4.apr



Source: Base Aerial Coverage: Southwest Division
Vegetation Communities: Southwest Division
SWWF and LBV Data: 1997 Griffith Data

300 0 300 600 900 Feet

Sensitive Species
- Least Bell's Vireo Sighting
- Southwest Arroyo Toad Sighting
- Gnatcatcher Sighting (1994)
- Southwest Willow Flycatcher Sighting

Vegetation Community Boundary

Figure 3-5
Vegetation & Sensitive Species of Ysidora Flats

9416.6 P-527/GIS/9416.6 P-527 (Latest)/Figure 5.apr

Riparian and Wetland Communities

Riparian communities occur along stream courses and drainages and are floristically and structurally distinct from the adjacent upland communities. Riparian communities may be floristically similar to each other, but may differ sufficiently in structure to warrant different classifications (forests, woodlands, scrub). Most of the dominant species in these communities require moist, bare mineral soils for germination and establishment, much like the conditions following periodic flooding (Holland 1986). Riparian and wetland communities that occur either on or adjacent to the project site(s) include southern willow riparian forest, southern willow scrub and mule fat scrub. The majority of these communities are dominated by willows (*Salix* sp.) and mulefat (*Baccharis salicifolia*). However, giant reed (*Arundo donax*), a noxious weed, is invading these native wetland communities, particularly within the Santa Margarita River Watershed, displacing native plant and animal species, including sensitive species. Often, riparian and wetland communities are regulated by the USACOE if the three parameters, hydrology, hydric soils and hydrophytic vegetation, are present. Jurisdictional wetlands boundaries are determined through jurisdictional delineations. The following discussion pertains to wetlands of undetermined jurisdictional status.

Southern Willow Riparian Forest

Southern willow riparian forests are tall, open forests along major streams and rivers that are dominated by several willow species including: arroyo willow (*Salix lasiolepis*), Goodding's black willow (*Salix gooddingii*) and narrow-leaved willow (*Salix exigua*). Understory species such as mule fat, mugwort (*Artemisia douglasiana*), and stinging nettle (*Urtica dioica* ssp. *holosericea*), may also be present (Beauchamp 1986). This community occurs along Pilgrim Creek adjacent to the STP 2 site. It also surrounds the mitigation site for the BRAC and Levee projects along the Santa Margarita River within the former Ysidora Ponds. The proposed Ysidora Flats discharge site is included in the mitigation site. One objective of this mitigation project is onsite natural recruitment of native riparian vegetation, including southern willow riparian forest. Natural recruitment of native riparian species and exclusion of exotic weeds is being monitored for at least five years.

Southern Willow Scrub

Southern willow scrub is found on loose, sandy, or fine gravelly alluvium deposited near stream channels during floods. Most stands are too dense to allow much understory to develop. Southern willow scrub may represent a successional stage leading to riparian woodland or may be stable. This community is generally dominated by arroyo willow and, occasionally, Goodding's black willow, narrow-leaved willow, and mule fat. This community currently occurs between Vandegrift

Boulevard and the former Ysidora Ponds as well as on some of the former pond berms that remain after the ponds were removed for the BRAC mitigation project. Southern willow scrub had previously occurred in patches throughout the Ysidora Ponds site along the Santa Margarita River.

Mule Fat Scrub

Mule fat scrub is a riparian shrub community that is dominated by mule fat in association with arroyo willow and Goodding's black willow. In the absence of frequent flooding and human-caused disturbance, this community may develop into a riparian woodland or forest (Holland 1986). This community is adjacent to the former Ysidora Ponds site, which is currently a mitigation site for the BRAC and Levee projects, and had occurred in some areas in the current mitigation site.

Southern Coastal Salt Marsh

Coastal salt marsh occupies wetland habitats that are subject to tidal influence and to varying degrees of freshwater input, primarily during the rainy season. Because of their coastal location they are also subject to salt spray. Salt marsh plants are mostly herbaceous perennials and low shrubs which are tolerant of both flooding and high salt content (Zedler et al. 1997). Coastal salt marsh plants are distributed along distinct zones depending upon such environmental factors as frequency and length of tidal inundation, salinity levels, and nutrient status (MacDonald 1977). The common species of the salt marshes of Camp Pendleton are: pickleweed (*Salicornia subterminalis*), (*S. virginica*), alkali heath (*Frankenia salina*) and salt grass (*Distichlis spicata*). The Santa Margarita River Estuary is the major salt marsh at Camp Pendleton covering approximately 159 acres (Zedler et al. 1997).

Disturbed Wetlands

Disturbed wetlands are communities that are dominated by exotic wetland species. These species invade sites that have previously been disturbed or are periodically disturbed. This perturbation regime has resulted in the displacement of native wetland species and the subsequent colonization of these areas by exotics. Disturbed wetlands are dominated by cocklebur (*Xanthium strumarium* var. *canadense*), umbrella sedge (*Cyperus* sp.), and curly dock (*Rumex crispus*). Disturbed wetlands occur in some areas around the mitigation site at the former Ysidora Ponds in some areas less than and also between the former ponds and Vandegrift Boulevard.

Grassland Communities

Non-native Annual Grassland

Most of the grasslands in the coastal and foothill areas of San Diego County are dominated by exotic annual grasses of Mediterranean origin. The factors that contributed to the replacement of native grasslands by non-native grasslands, are many. The Mediterranean region has a maritime climate similar to that of much of cismontane California. The Mediterranean region has a long history of agriculture and grazing activities and many of these introduced species are disturbance associated. Many of these species are thus pre-adapted to areas with similar climates and disturbance regimes. Intensive grazing and agriculture, accidental and intentional species introductions, along with some severe droughts during the early Spanish Era, allowed for the successful invasion of these exotic species and the subsequent displacement and exclusion of native grasses. It was initially believed that over grazing was the principle factor in the displacement of native grasses but there is considerable current debate over this. This association may have replaced native grassland and coastal sage scrub, as evidenced at many localities throughout San Diego County. Wild oats (*Avena barbata*) was the only grass species identifiable at the time of the survey within all the surveyed grasslands, but other exotic grass species such as red brome (*Bromus madritensis* ssp. *rubens*), ripgut grass (*Bromus diandrus*), and foxtail fescue (*Vulpia megalura*) are expected to locally dominate this community onsite. Characteristic forbs include sweet fennel (*Foeniculum vulgare*), red-stemmed filaree (*Erodium cicutarium*), and mustard (*Hirschfeldia incana*).

Ruderal

Areas of high and frequent soil disturbance that are generally bare or are dominated by non-native weedy forbs (herbaceous, non-grass species) that are adapted to a regime of frequent disturbances are classified as ruderal. Ruderal areas onsite consist of disturbed lands that have been completely invaded by weedy forbs (most abundantly, sweet fennel). Many of the species characteristic of ruderal areas are also indicator species of annual grasslands. Telegraph weed (*Heterotheca grandiflora*), mustard, sweet fennel, deer weed (*Lotus scoparius*), and red-stemmed filaree are the dominant species within the ruderal areas onsite.

Eucalyptus Woodland/Exotic Trees

This community is dominated by several species of gum trees or eucalyptus (*Eucalyptus* sp.). These introduced tree species produce large amounts of leaf and bark litter, the chemical composition of which inhibits the establishment of other species, especially natives, in the understory. Generally,

these species were planted for aesthetic and horticultural purposes, but many species of eucalyptus have become naturalized and have been quite successful in invading riparian areas.

Developed/Ornamental Areas

Developed/ornamental plant associations can be found in those portions of the study area that have been developed and support structures, or that have been planted with ornamentals, e.g. at STP 2.

Plant Associations for the Alternative Sites and Associated Pipelines

This section provides site-specific information about the plant associations described above, including acreages and locations within the focused study area.

Advanced Water Treatment Facility and Equalization Basin

The AWT site is developed with 0.4 acre of ornamentals and 0.6 acre of non-native grassland. The 1.0 acre Equalization Basin study area is entirely non-native grassland (see Figure 3-3). The proposed AWT facility at STP 13 is a component of Alternatives 3, 4 and 5. The proposed equalization basin at STP 13 is a component of Alternatives 4 and 5.

Sewage Treatment Plant 2

The STP 2 study area covers 1.0 acre of ruderal habitat within an existing developed area. The proposed site is adjacent to southern willow riparian forest and mulefat scrub habitat along Pilgrim Creek (see Figure 3-4). The proposed equalization basin and tertiary treatment facility at STP 2 are components of Alternative 2. Ruderal and disturbed habitat covers most of the proposed ten-inch force main pipeline route.

Ysidora Flats

Two sets of percolation ponds at Ysidora Basin, the Ysidora Ponds, were previously located along the Santa Margarita River between the river and Vandegrift Boulevard. Floods in 1993 breached the pond berms in several places. Subsequently, riparian vegetation became established on the site on which the ponds were located. The previously noted BRAC and Levee projects resulted in impacts to jurisdictional wetlands and riparian habitats. To mitigate for these impacts, wetlands are being created within the area of the former Ysidora Ponds. The berms that formed the ponds that were breached in 1993 were partly removed in 1997 to re-establish the natural floodplain of the

Santa Margarita River. While the mitigation site for the BRAC and Levee projects is currently (1998) in its first monitoring year, a mitigation plan is currently being prepared by the Marine Corps. According to permits issued by the USACOE on February 25, 1997 for the BRAC project, and on April 6, 1998 for the Levee project, mitigation objectives are as follows:

- create riparian habitat and jurisdictional wetlands by establishing appropriate hydrologic regimes and opportunity for natural recruitment of riparian vegetation;

- for five years after initiation of mitigation monitoring, control the invasion of noxious weeds (as specified in the USACOE permit), monitor the recruitment of native riparian vegetation and avifauna, and monitor hydrology and nutrient content; and

- by the end of the fifth monitoring year and for an additional twelve consecutive months, the site shall contain less than five percent relative cover of exotic species.

Wildlife

One invertebrate species, one amphibian species, two reptile species, 37 bird species, and four mammal species were observed during the surveys for this proposed project. A complete list of wildlife species is included in the Supplemental Biological Technical Report in Appendix B.

3.3.4 Sensitive Biological Resources

The study area was evaluated for the extent, quality, and significance of existing sensitive biological resources.

Sensitive Plant Species

Sensitive plants include those listed by the USFWS (1997a, 1997b), California Department of Fish and Game (CDFG) (1998a), and those plant species designated as rare, threatened, or endangered in California and elsewhere (List 1B species) by the California Native Plant Society (CNPS) (Skinner and Pavlik, 1994). No sensitive species were observed on the AWT Facility/Equalization Basin site and due to the lack of native habitat on this site, no sensitive plant species are expected to occur there. No sensitive plant species were found at the STP 2 and Ysidora Flats sites during surveys for the FSEIS/R.

Table 3-7 lists the more highly sensitive plant species known to occur on Camp Pendleton, if there is appropriate habitat within a study area, along with their sensitivity status and comments on their potential for occurrence onsite (see the footnotes to Table 3-7 for an explanation of the USFWS, CDFG, and CNPS designations).

Sensitive Animal Species

Sensitive animal species are those listed by the USFWS (1996a, 1997a, 1997b) and those listed by the CDFG (1998b) as sensitive for the reasons described earlier. The USFWS officially lists sensitive species as either threatened or endangered and, unofficially, lists other sensitive species as Federal Species of Special Concern. Several sensitive animal species were observed onsite or are known from immediately adjacent to the site(s). The sensitive wildlife species observed, or that have a potential for occurrence onsite, are listed in Table 3-7 along with their sensitivity status and comments on their distribution (see the footnotes to Table 3-7 for an explanation of the sensitivity designations). These federally listed species are discussed below.

California Gnatcatcher

One pair of coastal California gnatcatchers was observed in the sage scrub immediately north of the Lemon Grove ponds. Base-wide data indicate that the coastal sage scrub north and east of the site has supported the species. Base-wide data also indicate that this species occurs east and west of STP 2 (Griffith Wildlife Biology 1994). A single gnatcatcher vocalization was heard in the coastal sage scrub habitat to the west of the terminus of the ten-inch force main pipeline route. Another possible gnatcatcher was heard in the drainage in mulefat scrub northeast of STP 2.

Arroyo Southwestern Toad

The arroyo southwestern toad is known from the Santa Margarita River Basin and from upland locations north of the Santa Margarita River Basin near Stuart Mesa. The arroyo southwestern toad is not known to occur at Ysidora Flats, nor has it been reported from Pilgrim Creek near STP 2 as described in the FSEIS/R.

Table 3-7
Listed and Sensitive Species with Known or Potential Occurrence on or Adjacent to the P-527B Sewage Effluent Compliance Study Area

Species Name	USFWS Status*	CDFG Status*	Other*	On-Site Occurrence or Potential
Plants				
Thread-Leaved Brodiaea (*Brodiaea filifolia*)	T	E	CNPS 1B, 3-3-3	This species is known to occur on Camp Pendleton. Thread-leaved brodiaea has a low potential to occur in the grasslands of the Lemon Grove study area due to the lack of clay soils. Spring surveys are needed to determine presence or absence of this species onsite.
Orcutt's Brodiaea (*Brodiaea orcuttii*)			CNPS 1B, 1-3-2	This species has recently been reported on Camp Pendleton [north of the 25 Area, south of Kilo 2 (KEA 1998)]. Orcutt's brodiaea has a low potential to occur within the Lemon Grove study areas in vernally moist grasslands, swales, or streamside habitat.
Blochman's Dudleya (*Dudleya blochmaniae* ssp. *blochmaniae*)			CNPS 1B, 2-2-2	Known to occur on Camp Pendleton. This species occurs in sandy openings of coastal sage scrub near the coast. This species has a moderate potential for occurrence in the undisturbed sage scrub on the Lemon Grove study area, but was not observed during the survey.
Many-Stemmed Dudleya (*Dudleya multicaulis*)			CNPS 1B, 1-2-3	Known to occur on Camp Pendleton. This species occurs in openings of the ecotonal transitional areas between sage scrub and grasslands. This species has a moderate potential for occurrence in the undisturbed sage scrub on the Lemon Grove study area, but was not observed during the survey.
Coast Wallflower (*Erysimum ammophilum*)			CNPS 1B, 2-2-3	Known to occur on Camp Pendleton. The taxonomy of this entity in San Diego County is uncertain (i.e. populations previously identified as this species may be *E. capitatum*). Populations of this species have been previously identified in close proximity to the Lemon Grove study area. This "species" would have a high potential for occurrence within the undisturbed sage scrub of this study area, but was not observed during the survey.
Southwestern Spiny Rush (*Juncus acutus* ssp. *leopoldii*)			CNPS 4, 1-2-1	This species is known to occur on Camp Pendleton at the mouth of the Santa Margarita River Estuary.
Del Mar Sand Aster (*Lessingia filaginifolia* var. *linifolia*)			CNPS 1B, 3-2-3	Known to occur on Camp Pendleton. This species occurs in sandy coastal areas (both disturbed and chaparral habitats). Del Mar sand aster was not observed during the surveys and is expected to have a low potential for occurrence in the sandy areas of the study areas.
Cleveland's Goldenstar (*Muilla clevelandii*)			CNPS 1B, 2-2-2	This species is not reported to occur on Camp Pendleton. Cleveland's goldenstar occurs in grasslands and adjacent to vernal pools in areas of clay substrates. This species has a low potential for occurrence within the Lemon Grove study area, but was not observed during the survey.
Fish				
Tidewater Gody (*Eucyclogobius Newberryi*)	E			This species is historically known from the Santa Margarita River Estuary, but has not been reported from there since 1991.
Invertebrates				
Monarch Butterfly (*Danaus plexippus*)		SA-Over-wintering		Observed approximately 50 individuals airborne within the eucalyptus woodland at the Lemon Grove site.
Quino Checkerspot Butterfly (*Euphydryas editha quino*)	E			Not known to occur on Camp Pendleton.

Species Name	USFWS Status*	CDFG Status*	Other*	On-Site Occurrence or Potential
Riverside Fairy Shrimp *(Streptocephalus woottoni)*	E			Known to occur on Camp Pendleton in vernal pools.
San Diego Fairy Shrimp *(Branchinecta sandiegoensis)*	E			Known to occur on Camp Pendleton in vernal pools.
Amphibians				
Arroyo Southwestern Toad (*Bufo microscaphus californicus*)	E	SSC		Known to occur on Camp Pendleton within the Santa Margarita River basin.
Birds				
Golden Eagle (*Aquila chrysaetos*)	BEPA	SSC		Although no golden eagles were observed within the study area, the species may occasionally forage in the grassland habitats onsite. No nesting is expected in the project vicinity.
Coastal California Gnatcatcher (*Polioptila californica californica*)	T	SSC		One pair of gnatcatchers were observed in the coastal sage scrub at the Lemon Grove site immediately north of the ponds. A single gnatcatcher vocalization was heard in the coastal sage scrub habitat to the west of the terminus of the ten-inch force main pipeline route. Another possible gnatcatcher was heard in the drainage in mulefat scrub northeast of STP 2.
Least Bell's Vireo (*Vireo bellii pusillus*)	E	E		Known to occur at Camp Pendleton. Current data indicate that least Bell's vireo occupy the narrow band of southern willow scrub adjacent to the north end of the Lemon Grove site. This species is also known to occur in the Santa Margarita River at Ysidora Flats adjacent to the outfall facility and along Pilgrim Creek adjacent to Sewage Treatment Plant #2.
Southwestern Willow Flycatcher (*Empidonax traillii extimus*)	E			This species is known to occur in the Santa Margarita River at Ysidora Flats adjacent to the outfall facility.
Great Blue Heron (*Ardea herodias herodias*)		SA-Rookery	Everett-S	No suitable nesting habitat occurs within the study area.
Turkey Vulture (*Cathartes aura*)			Everett-D	One turkey vulture was observed circling over the Lemon Grove site, where it likely forages for carrion.
Osprey (*Pandion haliaetus*)		SSC-Breeding		Not likely to nest within the study area due to a lack of suitable habitat.
White-tailed Kite (*Elanus coeruleus majusculus*)		SA-Nesting		Observed at the Lemon Grove site. Not likely to nest within the study area due to a lack of appropriate habitat.
Loggerhead Shrike (*Lanius ludovicianus*)		SSC		One loggerhead shrike was observed in the ruderal habitat at the south end of the Lemon Grove site.

*Status Codes:

U.S. Fish and Wild Service (USFWS)
E = Endangered; T = Threatened; PE = Proposed Endangered; PT = Proposed Threatened; BEPA = Protected under Bald Eagle Protection Act

California Department of Fish and Game (CDFG)
E = Endangered; T = Threatened; FP = Fully Protected; SA = Special Animal; SSC = Species of Special Concern

California Native Plant Society (CNPS) (Skinner and Pavlik 1994)
List 1B - Plants rare and endangered in California and elsewhere

CNPS R-E-D Code
R (Rarity): 1 = Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction or extirpation is low at this time; 2 = Occurrence confined to several populations or to one extended population; 3 = Occurrence limited to one or a few highly restricted populations, or present in such numbers that it is seldom reported
E (Endangerment): 1 = Not endangered; 2 = Endangered in a portion of its range; 3 = Endangered throughout its range
D (Distribution): 1 = More or less wide spread outside California; 2 = Rare outside California; 3 = Endemic to California

Everett-D = Declining
Everett-S = Sensitive

Least Bell's Vireo

Current Base-wide least Bell's vireo survey results indicate that the species occupy suitable nesting habitat adjacent to the Lemon Grove site in the narrow strip of southern willow scrub west of the Twin Lakes Reservoirs and east of the proposed seasonal discharge pipeline turnout area (Griffith Wildlife Biology 1997). The Base-wide study also indicates that least Bell's vireo occupy habitat along Pilgrim Creek immediately to the east of STP 2 and along the Santa Margarita River at Ysidora Flats as described in the FSEIS/R.

Southwestern Willow Flycatcher

The southwestern willow flycatcher is known from the Santa Margarita River immediately west of the Ysidora Flats area and is documented in the FSEIS/R. This species is also known from Pilgrim Creek, south of STP 2 (Griffith Wildlife Biology 1997).

Non-Federally Sensitive Animal Species

Monarch Butterfly

During project surveys of the study area, groves of eucalyptus trees suitable for monarch butterfly wintering habitat were noted at the north end of the Lemon Grove site. Within the eucalyptus grove, approximately 50 monarch butterflies were observed flying around the trees 10 to 20 feet off the ground in five clusters of approximately 10 individuals each. No host plants were detected due to the timing of the survey.

Loggerhead Shrike

One loggerhead shrike was observed perched in the ruderal habitat on the south end of the Lemon Grove site. This species would be expected to forage over the non-native grasslands of STP 13.

Sensitive Habitats

Sensitive habitats are those which are considered rare within the region or support sensitive plants or animals. The sensitive habitats on or adjacent to the sites are: Diegan coastal sage scrub and riparian and wetland habitats (i.e., southern willow riparian forest, southern willow scrub, mule fat scrub, and disturbed wetlands). Riparian and wetland habitats would only be considered sensitive

if these communities would qualify as wetlands under the USACOE jurisdiction (if they meet the required hydrological, vegetation, and soil criteria).

Coastal Sage Scrub

Coastal sage scrub habitat on Camp Pendleton is considered sensitive if it is occupied by the federally threatened coastal California gnatcatcher. Oberbauer and Vanderwier (1991) estimate that only about 130,000 acres of sage scrub remain in San Diego County. This represents a 69 percent loss of this community in the County from the pre-European era. These estimates were based on 1988 vegetation coverage estimates and additional losses have accrued since. Loss of sage scrub within California is due primarily to grazing and urbanization.

Riparian and Wetland Habitats

Riparian communities are situated along stream courses and adjacent to stream banks. Riparian communities contain wetland habitats which are defined by specific hydrological, vegetation, and soil criteria. Wetland habitats are under the jurisdiction of the USACOE pursuant to Section 404 of the Clean Water Act of 1972, as amended in 1977 and 1984.

Wetlands serve many functions including flood and sediment control, habitat for rare and common species, corridors for wildlife movement, and control of water quality and erosion. Oberbauer and Vanderwier (1991) estimate that only about 13,600 acres or riparian woodland remain in San Diego County. This represents a 61 percent loss of this community in the county from the pre-European era estimate of 34,600 acres. These estimates were based on 1988 vegetation coverage estimates and additional losses have accrued since.

The loss and degradation of the riparian and wetland communities in southern California are the result of a variety of activities including the filling and draining of these habitats, clearing of riparian vegetation, water diversion and impoundment projects, grazing, channelization, increased erosion and sediment transportation, increased urban runoff, alteration of nutrient levels, lowering of water tables, contamination by agricultural fertilizers and pesticides, human recreational activities, sand and gravel mining, and invasion of exotic species (Bowler 1990; Ferren 1987).

USFWS Designated Critical Habitat

Critical habitat for the least Bell's vireo on the Santa Margarita River extends approximately eight kilometers (five miles) downstream from the Riverside/San Diego County line to the Camp Pendleton boundary (Santa Margarita y Las Flores Rancho grant boundary). Critical habitat for the least Bell's vireo was not designated on Camp Pendleton under the terms of a Memorandum of Understanding between the USFWS and USMC. The next closest designated critical habitat to the lower Santa Margarita River is the San Luis Rey River. Designated critical habitat along this river extends from the community of Pala approximately 35 kilometers (22 miles) downstream to Interstate 5 near Oceanside (USFWS 1998).

3.4 PUBLIC HEALTH AND SAFETY

Health and safety concerns identified in the FSEIS/R included the discharge of non-compliant secondary effluent into the Santa Margarita River. Since the effluent does not meet minimum RWQCB effluent standards, contamination of the Base potable water supply is a potential human health hazard. To date, however, no significant adverse effects on groundwater quality have been measured as a result of these discharge practices. The presence of secondary effluent in the surface waters of the Santa Margarita River could pose a health hazard to persons using the water for recreation or drinking. The hazard is relatively low because the course of the river, between the STP discharge points and the ocean, is entirely within MCB Camp Pendleton, and is not used for recreation or drinking. There is a possibility for recreational access at the mouth of the river from persons using Del Mar Beach. However, surface flows rarely occur during the summer and warm months of the year when there are recreational users at the beach.

3.4.1 Sewage Treatment Plant 2 Site

The STP site is within the fence of the existing STP facility. There are open tanks, chlorine systems and other equipment which have the chemical exposure hazards normally associated with an STP. Fencing, signs and the remote location minimize hazards to the general public.

3.4.2 Lemon Grove

The Lemon Grove pond area is unoccupied except for the construction activity associated with the construction of the ponds. No existing public health hazards have been identified. There is no barrier between the site and the railroad tracks which run through the site. Therefore, there are the normal public safety hazards associated with railroad operations, although the tracks in this section are rarely used. There are also the normal public and worker safety hazards associated with construction and grading activities.

3.4.3 Advanced Wastewater Treatment Site

The AWT facility site, adjacent to STP 13, is unoccupied. There are no evident public health or safety hazards currently associated with the site.

3.4.4 Ysidora Flats

The Ysidora Flats site is presently unoccupied. In 1997, the Ysidora Flats pond area was designated for use as a wetlands mitigation area for other Camp Pendleton actions, and the berms, dikes, and elevated areas west of the ponds were removed. There are no evident public health or safety hazards associated with the site.

3.5 SOCIOECONOMICS

The term socioeconomics describes the basic attributes and resources associated with the human environment, with particular emphasis on population, employment, and personal income. Substantial changes in these fundamental socioeconomic indicators may in turn influence related variables such as the provision of community services and utilities, and the cost and availability of housing. Because of the relatively limited scope of this project, which does not involve construction of substantial new facilities or uses, the relevant socioeconomic indicators are employment and housing for the proposed action generally, and the agricultural operations on leased Base property for Alternative 5. The region of influence (ROI) for socioeconomics as it applies to the proposed action is San Diego County, with particular emphasis on the cities of Oceanside, Vista, and Carlsbad, as these are the urban centers that are influenced the most by activities at the Base. Communities in Riverside and Orange Counties have not been included in the ROI because only 5 percent and 2.3 percent (respectively) of all military and civilian personnel at the base reside in these counties. The base has relatively little socioeconomic influence on these counties as compared to San Diego County. The socioeconomic data presented for San Diego County and local jurisdictions was obtained from the San Diego Association of Governments (SANDAG). Employment information for this section was derived from SANDAG's most recent (1995) Employment Inventory. Housing information was also derived from SANDAG and is current through 1997.

Employment increased in all three cities in the period between 1990 and 1995 by 17.9 percent. In 1995, the construction industry represented 4.2 percent of total employment in the ROI.

Multi-family housing units generally comprise about 35 percent of total units in Oceanside, Carlsbad, and Vista, while single-family units comprise about 50 percent of the total in these areas. These proportions generally parallel the conditions in the county as a whole. Vacancy rates were 8.2 percent for all three communities in January 1997.

3.6 ENVIRONMENTAL JUSTICE/PROTECTION OF CHILDREN

Executive Order 12898 requires federal agencies to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations. The aim of the Executive Order, as pointed out in the President's February 1994 memorandum, is to prevent low income and minority communities from being subject to disproportionately adverse environmental effects.

Communities on MCB Camp Pendleton in the vicinity of the proposed action include the Stuart Mesa and Wire Mountain military housing areas. The Stuart Mesa housing is approximately ¾ mile northwest of the Santa Margarita River, and further from the Lemon Grove Ponds and STP 13. The west side of the Stuart Mesa housing area is adjacent to the agricultural fields included in Alternative 5. The Wire Mountain housing area is approximately ¾ mile east and southeast of STP 13 and the Lemon Grove ponds. These military housing areas are occupied by families of varying races, ranging in grade from enlisted Marine to midgrade officers. The socioeconomic characteristics of families in these areas are such that they are not predominantly minority or low-income communities.

On April 21, 1997, Executive Order 13045, Environmental Health and Safety Risks to Children, was signed by President Clinton. The policy of the Executive Order states that:

> "A growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health risks and safety risks. These risks arise because: children's neurological, immunological, digestive, and other bodily systems are still developing; children eat more food, drink more fluids, and breathe more air in proportion to their body weights than adults; children's size and weight may diminish their protection from standard safety features; and children's behavior patterns may make them more susceptible to accidents because they are less able to protect themselves. Therefore, to the extent permitted by law and appropriate, and consistent with the agency's mission, each Federal agency:
>
> (a) shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and

(b) ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.

Under the definitions provided in Executive Order 13045, covered regulatory actions include those that may be "economically significant" (under Executive Order 12866) and "concern an environmental health risk or safety risk that an agency has reason to believe may disproportionately affect children." Further, Executive Order 13045 defines "environmental health risks and safety risks" [to] "mean risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (such as the air we breathe, the food we eat, the water we drink or use for recreation, the soil we live on, and the products we use or are exposed to)."

As noted above, the Stuart Mesa and Wire Mountain military housing areas are located within the vicinity of the proposed action. Many of the families include children. Three schools, in or adjacent to the Wire Mountain housing area, are one mile or more from the areas of the proposed alternative actions.

3.7 GEOLOGY AND SOILS

The geology and soils of the study area are discussed in the FSEIS/R. Pertinent aspects of these discussions are summarized below.

3.7.1 Geology

The project site is located within the Peninsular Ranges Geomorphic Province, within the coastal plain geomorphic subunit. The project site and immediate vicinity are underlain by a variety of marine and nonmarine sediments. The approximate distribution of the geologic units is characterized as follows:

Recent alluvium - Younger deposits of quaternary alluvium occupy nearly the entire length of the Santa Margarita River drainage in the project area, as well as the San Luis Rey River drainage.

Middle miocene marine sedimentary rocks - A formation of San Onofre Breccia extends south across the Santa Margarita Alignment, just north of STP 13.

Pleistocene marine deposits and marine terrace deposits - These beach ridge sand deposits exist at the STP 13 site and extend to the Pacific Ocean.

Tertiary nonmarine sedimentary rocks - Unnamed granitic conglomerate, coarse sandstone and white and green claystone are found north and south of STP 2 and in the plant area.

Eocene marine sedimentary rocks - The Santiago Formation of sandstone, siltstone and conglomerates is the geologic formation in the area of the Headquarters Alignment from Pilgrim Creek to the Ysidora Flats.

The Cristianitos fault zone, located northwest of the project site, consists of a number of northwest/southeast trending strike slip faults. In the local project area, two faults are suspected or postulated to exist, but are subject to disagreement among authorities. The project site is located in a highly active seismic region. However, the project site is not known to be directly underlain by active or potentially active faults. The Cristianitos fault zone, which is located northwest of the Santa Margarita Basin, is not considered active or potentially active.

The seismic hazard most likely to be detrimental to the project site is ground shaking resulting from a large earthquake generated on either a major regional or local fault. The maximum estimated peak ground acceleration at the project site would be produced by an earthquake event on the Offshore Zone of Deformation with a magnitude of 0.40g (i.e., 30% of the force of gravity). The Offshore Zone of Deformation, located offshore approximately 14 miles to the west, is a portion of the Rose Canyon Fault Zone.

An additional potential concern involves the concept of repeatable high ground acceleration (RHGA) on the project site. The estimated RHGA that could affect the project site is 0.26g.

Seismically induced ground rupture is defined as the physical displacement of surface deposits in response to earthquake-generated seismic waves, and generally occurs along faults. The project study area is not known to be directly underlain by active or potentially active faults.

No landslides or landslide-related features are known to directly underlie the project site.

3.7.2 Soils

The Soil Survey of the San Diego area prepared by the U.S. Soil Conservation Service (SCS) classifies the soils found within the project area predominantly as a variety of loams, with some loamy sands, sands, and clays. Table 3-8 lists these soil types and related characteristics. Footnotes are provided in Table 3-8 to clarify the hydrologic group, erodibility and shrink/swell characteristics of each soil type.

The project area is not considered to be underlain by significant mineral resources and is not actively being mined. In addition, there are no abandoned mines in the study area.

The project area is underlain by a variety of geologic materials. The younger and older alluvial deposits associated with drainages (e.g., Santa Margarita River Valley) typically possess a potential for the presence of paleontological resources that varies from low to unknown. Formational materials may possess a paleontological resource sensitivity that varies from moderate to high. The specific occurrence of fossil remains is often unknown until actual construction or disturbance by natural causes (e.g., erosion) reveals them.

Table 3-8
Soil Characteristics

Name	Symbol	Hydrologic Group[1]	Erodibility[2]	Shrink/Swell[3]
Coastal beaches	Cr	A	Severe	Low
Salinas clay loam, 2 to 9 percent slopes	SbC	C	Moderate	Moderate
Salinas clay, 2 to 5 percent slopes	ScB	C	Slight	High
Tujunga sand, 0 to 5 percent slopes	TuB	A	Severe	Low
Visalia sandy loam, 0 to 2 percent slopes	VaA	B	Severe	Low
Visalia sandy loam, 2 to 5 percent slopes	VaB	B	Severe	Low

Source: Soil Survey, San Diego Area, California prepared by the U.S.D.A. Soil Conservation Service, 1973.

[1] Hydrologic Soil Groups - Four hydrogeologic groups are used for estimating the runoff potential of soils. Group A has the lowest and Group D has the highest runoff potential.
Group A: Soils have high infiltration rate when thoroughly wetted; chiefly deep, well-drained to excessively drained sand, gravel, or both. Rate of water transmission is high, thus runoff potential is low.
Group B: Soils have moderate infiltration rate when thoroughly wetted; chiefly soils that are moderately deep to deep, moderately well drained to well drained, and moderately coarse textured.
Group C: Soil have slow infiltration rate when thoroughly wetted; chiefly soils that have a layer impeding downward movement of water, or moderately fine to fine textured soils that have a slow infiltration rate. Rate of water transmission is slow.
Group D: Soils have very slow infiltration rate when thoroughly wetted; chiefly clays that have a high shrink-well potential, soils that have a high permanent water table, a claypan or clay layer at or near the surface, or soils that are shallow over nearly impervious materials. Rate of water transmission is very slow.

[2] Soil erodibility by water - A rating of slight indicates that water erosion is a minor problem. Ratings of moderate and severe indicate that protective and corrective measures are needed.

[3] Shrink/Swell behavior - Shrink/swell is the change in volume that occurs in a soil with a change in moisture content. The volume change is determined mainly by the amount and kind of clay. In general, soil that has the highest content of expansive clay shrinks and swells the most with changes in moisture content.

3.8 AIR QUALITY

The existing air quality conditions in the study area are discussed in the FSEIS/R. Pertinent aspects of these discussions are summarized below.

The climate of San Diego County is characterized by warm, dry summers and mild, wet winters. One of the main factors that controls the local climatic regime is the location of the semi-permanent high-pressure area (the Pacific High) in the eastern Pacific Ocean. In the summer, this pressure center is located well to the north, causing storm tracks to be directed north of California. When the Pacific High moves southward during the winter, this pattern changes, and low-pressure storms are brought into the region, causing widespread precipitation. In San Diego County, the months of heaviest precipitation are November through April. The annual average rainfall at Oceanside is 10.7 inches. The average annual temperature is 59.2°F, and the average July and August high and January low are 72.9°F and 42.6°F, respectively (Pryde 1984).

In September 1997, subsequent to the publication of the FSEIS/R, the National Ambient Air Quality Standards (NAAQS) were revised by the USEPA. A new pollutant, fine particulate matter equal to or less than 2.5 microns in size ($PM_{2.5}$), was defined, and an additional ozone (O_3) standard was established. Policies and systems to implement these new standards are expected to be developed in the coming years. No new controls with respect to the new standards would be required by the USEPA until after the year 2002.

The Air Pollution Control District (APCD) air quality monitoring station nearest to the proposed site is within the Del Mar area of Camp Pendleton. The APCD began operation of the Camp Pendleton Del Mar monitoring station in 1997. The station monitors ozone, nitrogen dioxide (NO_2), and meteorological conditions. The nearest APCD station with long-term (i.e., dating back at least five years) data is located in the City of Oceanside. The Oceanside monitoring station currently monitors ozone, carbon monoxide (CO), NO_2, and particulate matter equal to or less than 10 microns in size (PM_{10}). Table 3-9 presents a summary of the exceedances of standards and the highest pollutant levels recorded at this station for the years 1993 through 1997 (the latest year for which the APCD has published summary data from the Oceanside monitoring station). Camp Pendleton is within the San Diego Air Basin (SDAB) which is currently classified as a federal and state "serious" ozone nonattainment area, a federal maintenance area for CO, and a state nonattainment area for PM_{10}.

Table 3-9
Oceanside Monitoring Station
Ambient Air Quality Summary

Pollutant	Averaging Time	California Air Quality Standards	Federal Primary Standards	Maximum Concentrations[1]					Number of Days Exceeding Federal Standard[2]					Number of Days Exceeding State Standard[3]				
				1993	1994	1995	1996	1997	1993	1994	1995	1996	1997	1993	1994	1995	1996	1997
Oxidants (Ozone)	1 hr	0.09 ppm	0.12 ppm	0.16	0.11	0.11	0.11	0.11	4	0	0	0	0	7	2	5	4	6
Carbon Monoxide	1 hr 8 hrs	20 ppm 9 ppm	35 ppm 9 ppm	5.3 7.0	5.2 3.9	4.4 3.1	4.0 2.6	6.1 2.9	0	0	0	0	0	0	0	0	0	0
Nitrogen Dioxide	1 hr Annual	0.25 ppm N/A	N/A 0.053 ppm	0.12 0.020	0.12 0.020	0.14 0.019	0.11 0.017	0.11 0.02	N/A 0	N/A 0	N/A 0	N/A 0	N/A 0	0 N/A	0 N/A	0 N/A	0 N/A	0 N/A
PM_{10}	24 hrs Annual/ AAM[3] Annual/AGM[3]	50 mg/m^3 N/A 30µg/m^3	150 µg/m^3 50 µg/m^3 N/A	68 29 26	75 29 25	83 30 27	62 26 24	50 26 25	0 0 N/A	0 0 N/A	0 0 N/A	0 0 N/A	0 0 N/A	0 N/A 0	0 N/A 0	0 N/A 0	0 N/A 0	0 N/A 0

(1) Concentration units for ozone, carbon monoxide, nitrogen dioxide, and sulfur dioxide are in parts per million (ppm). Concentration units for PM_{10} are in micrograms per cubic meter (µg/m^3).
(2) For annual standards, a value of 1 indicates that the standard has been exceeded.
(3) AAM = annual arithmetic mean; AGM = annual geometric mean.
N/A = not available
Source: San Diego APCD, 1998.

The Clean Air Act Amendments of 1990 (Pub. L. 101-549, 104 Stat. 2399) required the USEPA to promulgate rules to ensure that federal actions conform to the appropriate state implementation plan (SIP). These rules, known together as the General Conformity Rule (40 C.F.R. §§ 51.850-.860 and 40 C.F.R. §§ 93.150-.160), require any federal agency responsible for an action to determine if its action conforms with pertinent guidelines and regulations. Certain actions are exempt from conformity determination, including those actions associated with transfers of land or facilities where the federal agency does not retain continuing authority to control emissions associated with the properties. Federal actions may also be exempt if the projected emission rates would be less than specified emission rate thresholds, known as *de minimis* limits, and less than 10 percent of the area's annual emission budget.

3.9 LAND USE

The proposed action lies entirely within the jurisdiction of MCB Camp Pendleton. Existing land use within MCB Camp Pendleton's 125,000 acres includes large military training areas for weapons impact and for maneuvers, and isolated development areas, which are connected by paved roads and surrounded by open space. Various operation, supply, and infrastructure facilities line the major road system throughout the Base, particularly Vandegrift Boulevard, Basilone Road, and Stuart Mesa Road. Ancillary uses (hospital, schools, golf course, fields, etc.) are located throughout the Base. Some sections of the Base are leased to private entities for agricultural, recreational, and industrial purposes (Figure 3-6). One group of leases relevant to this action includes the agricultural parcels, which are part of Alternative 5.

STP 2 is surrounded by undeveloped land of varying topography. Pilgrim Creek is located to the west. The nearest developed areas are the rodeo grounds located approximately 1,200 feet to the north on the western side of Vandegrift Boulevard, and the San Luis Rey housing community further northeast on the east side of Vandegrift Boulevard.

The Lemon Grove area is a disturbed habitat that was previously a citrus orchard. It is no longer used for agriculture or other urban activity and has been gradually returning to a more natural habitat. Trees and interior roads are located along a portion of the perimeter. The portion of the Lemon Grove site identified in the FSEIS/R for percolation ponds has been cleared and grubbed in preparation for construction of the ponds. Surrounding land uses include STP 13 and the MCB Camp Pendleton rail spur to the east, the Santa Margarita River to the north and northwest, and I-5 and the Amtrak/Coaster/Santa Fe rail corridor to the west and southwest. The Base Commissary is located to the southeast. To the west, beyond I-5, is the Camp Del Mar area.

The AWT plant site (included in Alternatives 3, 4 and 5) is located adjacent to, and on the east side of STP 13, near the intersection of Vandegrift Boulevard and Stuart Mesa Road. Land uses surrounding the AWT plant site consist of the Base recycling center and undeveloped lands proposed for expansion of the Lemon Grove ponds to the south, with the Commissary complex further south; open space to the north; and STP 13, the abandoned Camp Pendleton rail line, the Lemon Grove area, and the Santa Margarita River to the west. Three family housing areas lie to the east, beyond Vandegrift Boulevard and open space.

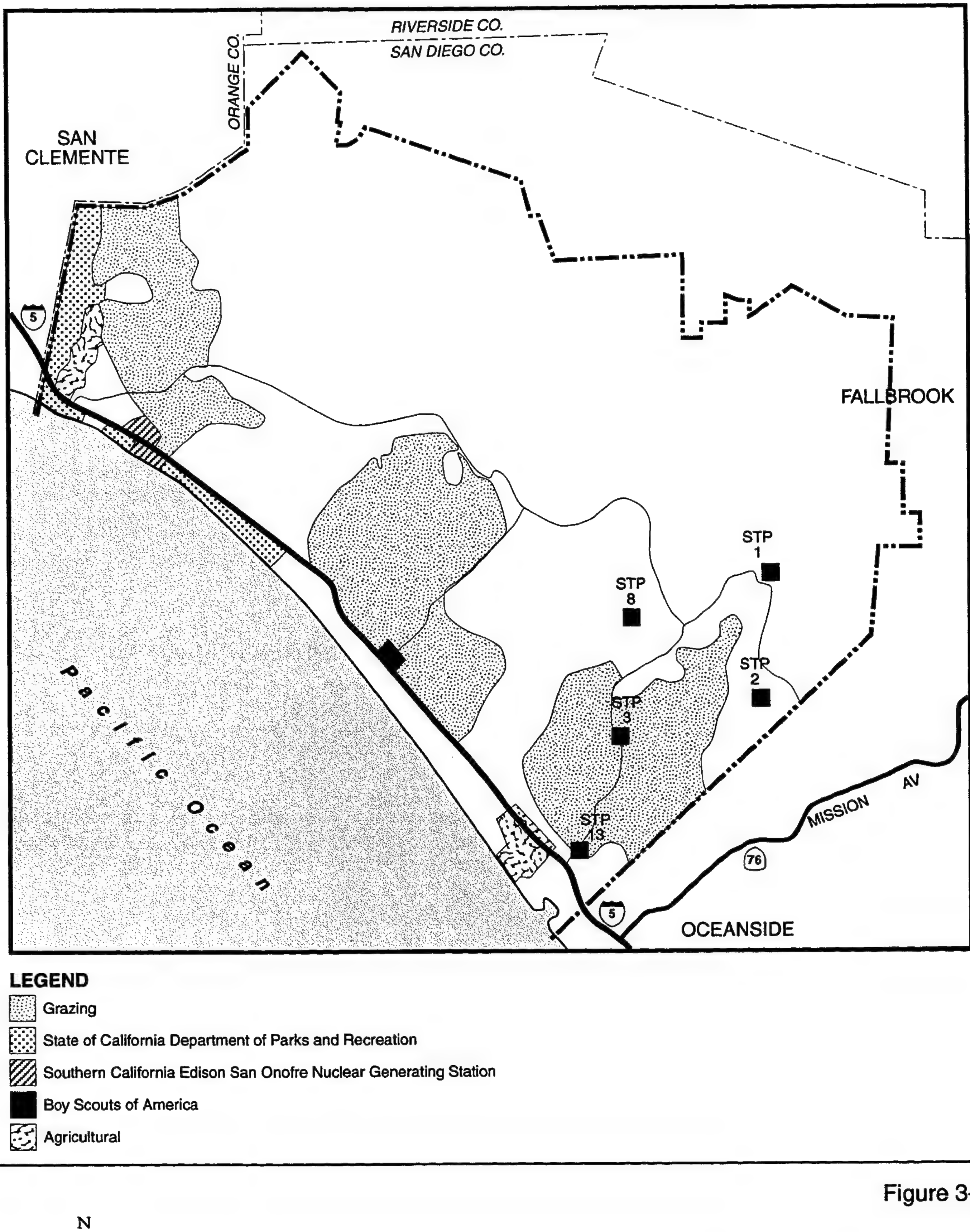


Figure 3-6

Outleased Areas at MCB Camp Pendleton

9416 P-527/Figures/Figure 3-6 Outleased Areas

The Ysidora Flats area is located on the west side of Vandegrift Boulevard, approximately 2.5 miles northeast of STP 13. Prior to 1993, percolation ponds were located in the Ysidora Flats area between Vandegrift Boulevard and the Santa Margarita River for the purpose of disposal of effluent from STP 13. The ponds were found to have poor percolation capacity, and were not used for the STP 13 discharge. In January 1993, the ponds were severely damaged by floods; however, a pipeline into the ponds remains. In 1997, the Ysidora Flats pond area was designated for use as a wetlands mitigation area for other Camp Pendleton actions, and the berms, dikes and elevated areas west of the ponds were removed. The corridor through the Ysidora Flats area at the location of the existing pipeline is an access road created for the wetlands mitigation activity. Surrounding land uses include undeveloped land.

The leased agricultural lands (which are included in Alternative 5) are located north of the Santa Margarita River, and east and west of the I-5 and railroad corridor. The present land use is crop production, principally cucumbers, tomatoes, and potatoes. The beach and Pacific Ocean are to the west of the agricultural lands; the Stuart Mesa housing area is to the east. At the northwest corner are buildings used by the Marine Corps Tactical Systems Support Activity (MCTSSA); the remainder of the area to the north is undeveloped. The Santa Margarita River flood plain is to the south.

3.9.1 MCB Camp Pendleton Master Plan

Land development within the Base is guided by the MCB Camp Pendleton Master Plan (September 1992). The Master Plan's goal is to "develop guidelines for optimum utilization of land and airspace to support the Camp Pendleton mission." It recommends improvements and new development that would replace or modify existing inadequate facilities, relocate various military activities within the Base, and reduce existing environmental problems. The Master Plan includes individual area plans and capital improvement plans for each of the developed areas within the Base. None of the FSEIS proposed action sites are within an area designated for a specific use in this Master Plan.

3.9.2 MCB Camp Pendleton Range Compatible Use Zone (RCUZ) Program

The RCUZ Program was established to provide guidelines for siting of future on-base facilities. The general purpose of the RCUZ Program is to create, to the greatest extent possible, compatible land uses within MCB Camp Pendleton for the various types of facilities as they relate to noise and safety hazards generated by the many military training activities conducted on the base. The RCUZ program identifies Noise and Range Safety Zones, which reflect the areas within MCB Camp

Pendleton where the majority of these training activities occur. The primary objective of RCUZ is to preserve MCB Camp Pendleton's existing amphibious, ground, aviation range and training areas which are critical to MCB Camp Pendleton's ability to meet its national security mission of providing a realistic environment to train the nation's combat marines.

3.9.3 Coastal Zone Management Act

The proposed action analyzed in this FSEIS is located within the area requiring compliance with Federal Consistency implementory regulations (15 C.F.R. § 930, et seq.) of the Coastal Zone Management Act (16 U.S.C. § 1451 et seq.). The Act is designed to protect resources in the coastal zone environment. Chapter 1, Section 30001.5 of the California Coastal Act includes the following basic goals of the state for the coastal zone environment:

- Protect, maintain, and, where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and artificial resources.

- Assure orderly, balanced utilization and conservation of coastal zone resources taking into account the social and economic needs of the people of the state.

- Maximize public access to and along the coast and maximize public recreational opportunities in the coastal zone consistent with sound resources conservation principles and constitutionally protected rights of private property owners.

- Assure priority for coastal-dependent and coastal-related development over other development on the coast.

- Encourage state and local initiatives and cooperation in preparing procedures to implement coordinated planning and development for mutually beneficial uses, including educational uses, in the coastal zone.

3.10 NOISE

Noise is defined as unwanted or objectionable sound. The effects of noise can include general annoyance, interference with speech communication, sleep disturbance, and, in the extreme, hearing impairment.

The standard unit employed for noise measurements is the decibel (dB). Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Doubling the noise level results in an increase of 3 dB; halving the noise level results in a decrease of 3 dB. The human ear is not equally sensitive to all frequencies within the sound spectrum. Therefore, the "A-weighted" noise scale, which weights the frequencies to which humans are sensitive, is used for measurements. Noise levels using A-weighted measurements are sometimes written dB(A) or dBA. In this FSEIS, all noise levels discussed are A-weighted and dB is understood to identify the A-weighted decibel.

Average noise levels over a period of minutes or hours are usually expressed as dB L_{eq}, the equivalent noise level. The period of time average may be specified; $L_{eq(3)}$ would be a three-hour average. Noise levels that are often used to evaluate noise-land use compatibility are averaged over a period of 24 hours, and are normally weighted to account for greater human sensitivity to noise in the evening and nighttime hours. These 24-hour noise averages are the Community Noise Equivalent Level (CNEL) and the Day-Night level (DNL or L_{dn}). For purposes of this FSEIS, CNEL, and L_{dn} may be considered equivalent.

3.10.1 <u>Sensitive Receptors</u>

Noise sensitive receptors are generally considered to be human activities or land uses that may be subject to the stress of significant interference from noise. They often include residential dwellings, mobile homes, hotels, motels, hospitals, nursing homes, education facilities, and libraries. Noise sensitive receptors may also include sensitive wildlife.

STP 2 is located south of Vandegrift Boulevard, near the San Luis Rey gate. The plant is surrounded by open space of varying topography. The closest human noise receptors are housing units located 1,200 feet to the northeast, on the north side of Vandegrift Boulevard. Sensitive bird species (least Bell's vireo) may nest near Pilgrim Creek, east of STP 2.

There are no human noise sensitive receptors within 1,000 feet of the Lemon Grove or Ysidora Flats sites. There are songbirds near the north end of the Lemon Grove site; the specific species and locations are described in Section 3.3 of this FSEIS. Sensitive birds (least Bell's vireo, southwestern willow flycatcher) have also been identified adjacent to the Ysidora Flats mitigation area.

3.10.2 Noise Sources

Noise sources in the FSEIS study area include vehicle traffic on I-5, Stuart Mesa Road, Vandegrift Boulevard and other Base roadways; rail traffic; agricultural machinery in the fields; and, construction equipment at Lemon Grove. All of the FSEIS study area is subject to frequent noise impact from routine military helicopter flights and additional periodic noise intrusion from weapons and aircraft during training operations.

3.11 TRANSPORTATION AND VEHICULAR CIRCULATION

The principal north-south route in the vicinity of MCB Camp Pendleton and the City of Oceanside is Interstate 5 (I-5). In Oceanside, south of MCB Camp Pendleton, State Route (SR-) 76 and SR-78 are east-west roadways connecting I-5 to I-15, the inland north-south freeway. I-5 provides direct access to the Base at the Oceanside (Main), Las Pulgas, Christianitos and San Onofre gates. From SR-76, the Base can be accessed through the San Luis Rey gate. The Del Mar gate provides access from the City of Oceanside to the Del Mar area of the Base, west of I-5.

The following major Base roadways would be affected by one or more alternatives of the proposed action:

Vandegrift Boulevard is a four-lane highway that makes a loop from the Oceanside gate to the San Luis Rey gate, and provides access to the major population centers of the Base.

Stuart Mesa Road is a two-lane roadway extending northwest from Vandegrift Boulevard and across the Santa Margarita River. The road continues northwest, widening to 3 or 4 lanes in some places, past the Stuart Mesa housing area, and ending at Las Pulgas Road.

3.12 VISUAL RESOURCES

3.12.1 Lemon Grove Site

The Lemon Grove ponds cover approximately 22 acres and are located southwest of STP 13, on the west side of the railroad tracks. The landscape character of the Lemon Grove site is primarily open space with low-lying grasses, shrubs, and groves of mature trees. I-5 is located adjacent to the site's western boundary, while an east-west unpaved road, and the Camp Pendleton railroad tracks bound the site's southern edge.

3.12.2 Advanced Wastewater Treatment Site

The AWT plant site for Alternatives 3, 4, and 5 is located on the east side of STP 13, with the Twin Lakes lagoons to the north and northwest. The treatment plant, clarifier tanks, and the effluent lagoons contribute to the site's light industrial character. The undeveloped area immediately surrounding the plant is predominantly open, level terrain, with minimal vegetation consisting of low-lying grasses and shrubs. The open area to the immediate south is the proposed site for the equalization basin. Viewers within the vicinity of the AWT site are motorists traveling along Stuart Mesa Road, Vandegrift Boulevard, and I-5. Views of the treatment plant from the residential development approximately 4,500 feet to the east, along Wire Mountain, are limited by distance and intervening vegetation.

3.12.3 Ysidora Flats

In 1997, the Ysidora Flats pond area was designated for use as a wetlands mitigation area for other Camp Pendleton actions, and the berms, dikes and elevated areas west of the ponds were removed. The corridor through Ysidora Flats area at the location of the existing pipeline is an access road created for the wetlands mitigation activity. Views of the pond area are limited by mature landscaping and are only visible through access road openings to motorists along Vandegrift Boulevard. The site is fairly flat and located within the 100-year floodplain of the Santa Margarita River.

3.12.4 Sewage Treatment Plant 2 Site

STP 2 is located approximately two miles south of the Headquarters Area and is immediately adjacent to Pilgrim Creek. The landscape character of the plant consists of a level site located

between a small natural hill to the east and Pilgrim Creek, approximately 400 feet to the west. The site supports the sewage treatment plant, a pump station, and an equalization pond. A paved road is also located onsite.

The surrounding area consists primarily of open space associated with the adjacent creek and undulating hills to the west. Immediately east of the plant is an undeveloped area covered with dry grasses and shrubs. The visual character of the surrounding area to the northeast gradually changes from open, undeveloped land to urban uses consisting of residences, recreational facilities, and the rodeo grounds. The rodeo grounds, located approximately 1,200 feet to the north, are separated from the treatment plant by a large, graded dirt area. Natural features that noticeably contribute to the visual character of the surrounding landscape are dense vegetation and trees that grow along Pilgrim Creek and undulating hills to the west.

The westerly viewshed for STP 2 extends towards the rolling hills approximately 600 feet to the west, while the rodeo grounds provide expansive views to the plant at a distance of approximately 1,200 feet to the north. The eastern viewshed is not as clear due to an intervening hillside which slopes down toward the treatment plant, blocking views of the plant from the surrounding land uses and motorists on Vandegrift Boulevard.

Viewers in proximity to STP 2 consist of rodeo grounds users and roadway travelers. Existing residential areas, located approximately 1,200 feet north of the plant, along the elevated hills, have very limited views of the plant. This is due to the distance involved and the location of the treatment plant which is at the foot of a natural hill. The hillside also serves as a visual buffer, limiting views to the treatment plant from residences and motorist along Vandegrift Boulevard to the east. Rodeo grounds users have distant, partially screened views of the site.

3.13 UTILITIES

The potable water supply for MCB Camp Pendleton is derived completely from groundwater resources within the Base boundaries. There are "north" and "south" water systems on the Base. The south water system (which covers the project area) consists of wells, water mains, booster pumps, and storage reservoirs with a total capacity of 21.5 million gallons. A discussion of groundwater and surface water resources is provided in Section 3.1 of this FSEIS.

The Base operates two sanitary landfills: the Las Pulgas and San Onofre landfills. Hazardous wastes listed under Title 22 of the California Administrative Code that are generated on-Base are containerized, labeled by the generating unit under direction of Assistant Chief of Staff, Environmental Security, and transported by the unit to the Base Hazardous Waste Storage Facility in the 24 Area (between MCAS Camp Pendleton and the Headquarters area). These wastes are then disposed off-Base in accordance with current state and federal regulations by an Assistant Chief of Staff, Environment Security-managed contract.

Electrical power is purchased from the regional utility company, San Diego Gas and Electric Company (SDG&E), which has two major transmission lines traversing the Base. The Base electrical system consists of aboveground pole mounted lines, with the exception of the underground lines serving some of the family housing areas.

MCB Camp Pendleton purchases liquefied natural gas from SDG&E; gas mains feed some Base facilities directly and also supply a Base storage system, which feeds an MCB Camp Pendleton gas distribution system. MCB Camp Pendleton also purchases liquefied petroleum gas by tanker truck from sources in the San Diego area.

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CHAPTER 4.0
ENVIRONMENTAL CONSEQUENCES

4.0 ENVIRONMENTAL CONSEQUENCES

This section provides an analysis of environmental impacts and associated mitigation measures for each issue addressed in this FSEIS. There are three levels of impact: significant impacts, less than significant impacts, and no impacts. The term impact, as used within this document, refers to impacts that are adverse in nature.

Significant impacts are defined in terms of context and intensity. Context is related to the uniqueness of a resource. Intensity refers to the severity of the impact (i.e., the magnitude of the impact on the environment).

Mitigation measures for both significant and less than significant impacts are provided to reduce significant and adverse impacts associated with the proposed action and alternatives to an acceptable level. These measures can include:

- avoiding the impact altogether by not taking a certain action or parts of an action;
- minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- reducing or eliminating the impact over time by restoration and maintenance operations during the life of the action; and
- compensating for the impact by replacing or providing substitute resources or environments.

4.1 HYDROLOGY AND WATER QUALITY

4.1.1 Alternative 1: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains

Environmental Impacts

Surface Water Quality

Disposal of the total combined effluent through gravity injection would eliminate the existing surface water discharge of effluent which exceeds permitted limits for certain constituents. Therefore, implementation of Alternative 1 would be beneficial to surface water quality.

In order to evaluate the potential for surfacing of the percolated effluent (daylighting) in the estuary or the adjacent salt marsh, a study was conducted which included construction of three pilot test basins at the site of the proposed Lemon Grove ponds (Group Delta 1998b). The study is described in the Summary and in Section 2.1.3 of this FSEIS. Two test basins included vertical drains and instrumentation to monitor soil moisture and groundwater levels at wells, moisture sensors, and piezometers within and adjacent to the Lemon Grove site. Groundwater modeling was conducted to evaluate the design of the basins to optimize percolation and to minimize the potential for effluent surfacing and related impacts to surface water quality. Based on this study, project plans for disposal at the Lemon Grove ponds were revised to case the vertical drains, and discharge the treated effluent directly into the groundwater, i.e., gravity injection. The revised pond and drain design would essentially eliminate percolation from the ponds and the lateral flow of undiluted effluent, and thus avoid significant impacts to surface water quality.

In addition, groundwater flow and solute transport calculations were made (Group Delta 1998b) to estimate the change in nitrate concentrations in the groundwater which would occur as a result of the proposed disposal program; and to determine if surfacing of the percolated effluent in the estuary would occur as surface discharge of secondary effluent, and if the concentration of constituents in the effluent, especially nitrogen, would be in excess of Basin Plan limits.

This groundwater/solute transport modeling was conducted for disposal of an average of 3 MGD of effluent. Based on preliminary data from this model, approximately 90 percent of this 3 MGD (i.e., approximately 2.7 MGD) would flow through high conductivity terrace deposits under the developed Camp Del Mar area and southwest to the ocean, rather than northwest through the low permeability river deposits toward the estuary. The remaining 10 percent, or approximately 300,000 gallons/day,

would be added to the existing groundwater flow beneath the estuary. Predicted groundwater elevations, based on the modeling, are shown in Figure 4-1. Surfacing of groundwater in the river would occur only if groundwater elevations exceeded ground elevations at the bluff, and would be a small fraction of the approximate 300,000 gallons per day of groundwater flow in the west and northwest directions.

Currently MCB Camp Pendleton discharges approximately 1.5 MGD of secondary effluent from STP 13 directly into the Santa Margarita River above the estuary. This secondary effluent contains an average of 21 mg/liter of total nitrogen. Based upon initial model results, with implementation of Alternative 2, total nitrogen concentrations in groundwater as a result of effluent discharged to the water table would have a concentration of less than 1 mg/liter at the river and approximately 1 mg/liter where it discharges at the ocean. Predicted groundwater nitrate concentrations, based on the modeling, are shown in Figure 4-2.

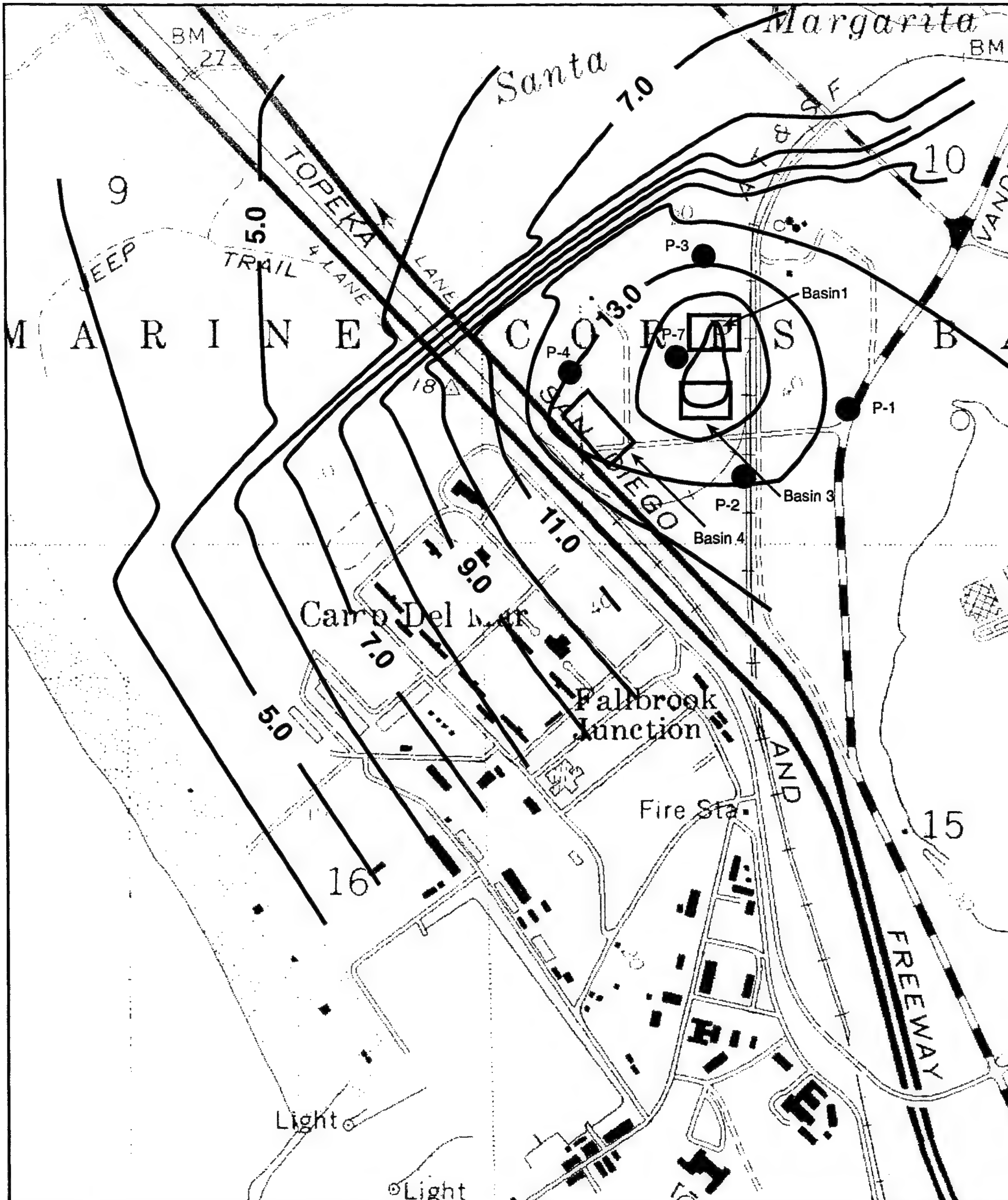
Phosphorous concentrations were not specifically modeled, as the dilution effect would be the same as for nitrogen. Based upon initial model results, total phosphorous concentrations in groundwater as a result of effluent discharged to the water table, would have a concentration of less than 0.25 mg/l in the vicinity of the river and approximately 0.25 mg/l where it discharges to the ocean. Therefore, the total phosphorous composition would be significantly reduced from the 5.8 mg/l currently being discharged into the Santa Margarita River from STP 13.

Therefore, the large volume of secondary effluent currently continuously discharging into the river channel would be eliminated. A relatively small volume of groundwater containing diluted effluent may periodically surface in the river channel. The net effect from the reduced volume of discharged effluent would be beneficial to surface water quality. Further, the total nitrogen composition of any discharge would be significantly reduced. In order to assure that potentially significant impacts are avoided, the surface water would be monitored in accordance with a program that would be approved and permitted by the cognizant resource agencies.

Groundwater Quality

Basin Plan

As noted in Section 3.1, the Basin Plan establishes numerical groundwater quality objectives for the portion of the Ysidora HA which is east of the easterly boundary of I-5. Previously, the RWQCB deleted the beneficial uses and groundwater objectives for the coastal area west of the easterly



SOURCE: USGS Quad base, Group Delta Consultants

5.0 Calculated Groundwater Elevations, Feet (MSL)

P-2 Site Monitor Well

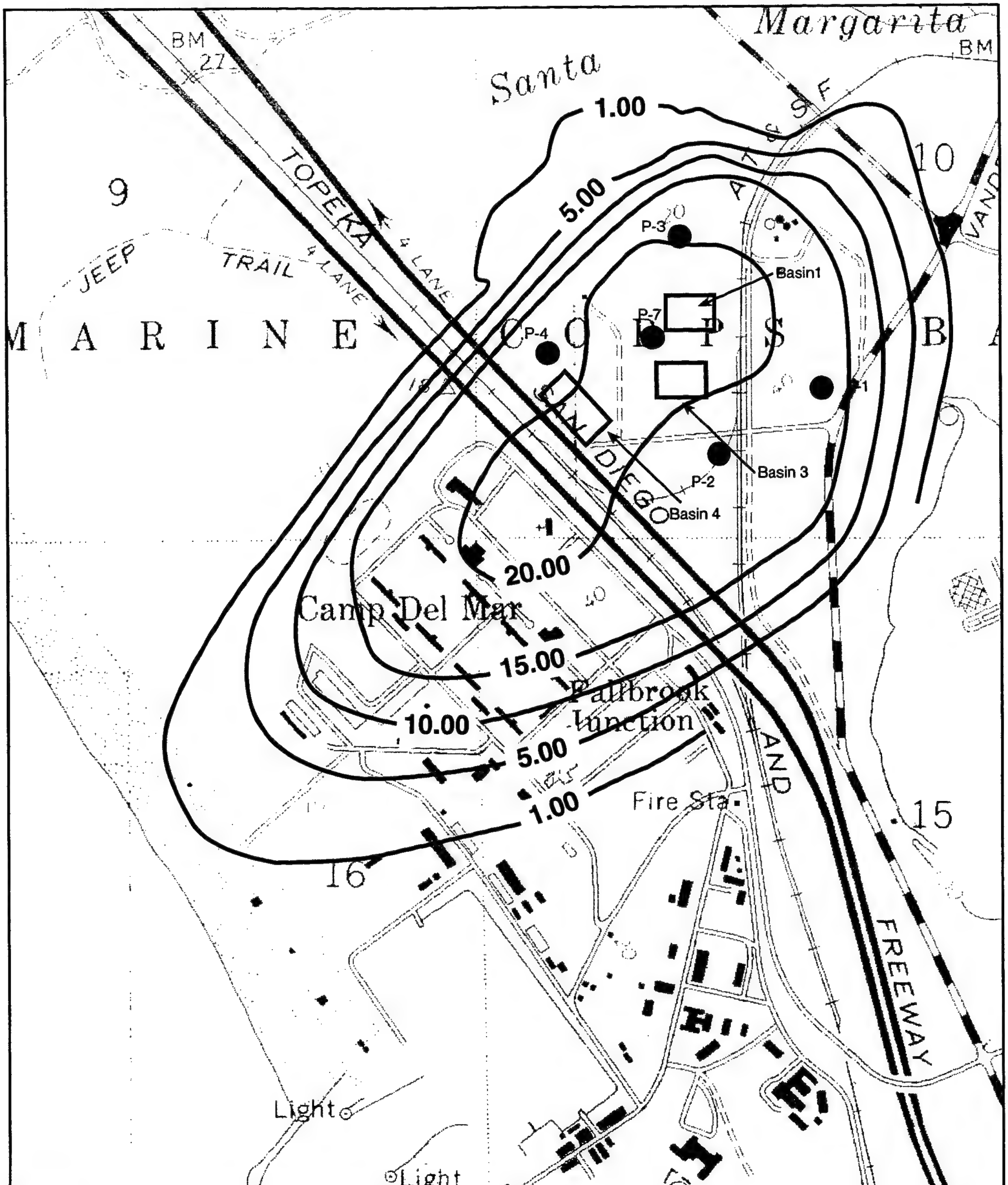
0' 500' 1000'

NORTH

Figure 4-1

Predicted Groundwater Elevations for Disposal Through Cased Vertical Drains

9416 P-527/Figures/Figure 4-1 Predicted Elevations



SOURCE: USGS Quad base, Group Delta Consultants

10.00 Calculated Nitrate Concentration As Total Nitrogen, mgLl

P-2 Site Monitor Well

0' 500' 1000'

NORTH

Figure 4-2

Predicted Nitrate Concentrations in Groundwater for Disposal Through Cased Vertical Drains

9416 P-527/Figures/Figure 4-2 Predicted Nitrate

boundary of I-5. Because the Lemon Grove ponds and vertical drains would be located immediately east of the boundary, and there is no current utilization of groundwater in the area, application of the coastal groundwater quality policy, i.e., no beneficial uses or objectives, would be requested.

Table 4-1 compares the projected quality of effluent discharge with postulated average groundwater quality in the Lemon Grove vicinity, and with Basin Plan groundwater quality objectives. As shown in Table 4-1, the proposed discharge is projected to be of significantly better quality than existing groundwater in the vicinity of Lemon Grove. With the exception of TDS, the reclaimed water discharge also would be superior in quality to the Basin Plan groundwater quality objectives that apply east of I-5. The groundwater in the vicinity of Lemon Grove is of such poor quality and high salinity that future beneficial use of the groundwater is highly improbable (even with groundwater demineralization). Implementation of Alternative 1 would improve the overall groundwater quality, although the concentration of one constituent, TDS, would exceed the Basin Plan objective at the discharge point, the impact to water quality would not be significant.

Table 4-1
Comparison of Recharge Water with
Basin Plan Mineral Objectives and Existing Groundwater Quality

Constituent	Projected Quality of Discharge[1] (mg/l)	Postulated Existing Groundwater Quality in Vicinity of Lemon Grove[2]	Basin Plan Objectives Immediately Downstream from Lemon Grove Site[3]	Basin Plan Objectives Upstream from Percolation Pond Site[3] (mg/l)
TDS	960	36,100	No Objective	750
Chloride	198	20,300	No Objective	300
Sulfate	225	2,380	No Objective	300
Iron	0.22	N/A	No Objective	0.3
Manganese	< 0.1	N/A	No Objective	0.05
Boron	0.3	N/A	No Objective	0.75
Fluoride	0.6	N/A	No Objective	1.0

1 From sample analyses collected from flow-weighted composite sample from MCB Camp Pendleton STPs 1, 2, 3, 8, and 13. Samples collected on 9/30/96.
2 Groundwater quality from Well No. 11S/5W-5J1, as presented in Table 3-4
3 From Table 3-1

Potable Water Sources

No actual groundwater use for potable supply now occurs, or is anticipated to occur, within 3.7 miles of the Lemon Grove discharge site. Further, the nearest wells are located upgradient and upstream from the pond site. Therefore, there would not be any significant impacts to potable water sources.

The discharge of up to 3.6 MGD of effluent to the groundwater in the Lemon Grove area would provide a barrier to reduce the saltwater intrusion into the upstream groundwater. This impact would be beneficial, providing enhanced protection of potable water sources.

Estuary

Replacement of the current surface water discharge from STP 13 with groundwater discharges under this alternative would benefit the downstream estuary by: 1) decreasing freshwater influences on the estuary during summer and autumn months; and 2) limiting the quantity of nutrients discharged to the estuary. This would result in more natural conditions in the estuary, under which freshwater flows reach the estuary only during periods of significant natural runoff. Modeling indicated that groundwater will likely discharge to the surface north and northwest of the ponds, as evidenced by projected groundwater elevation contours that are greater than topographic elevations (Figure 4-1). Predicted nitrate concentrations at these locations range from 1-15 mg/l (Figure 4-2). Phosphorous concentrations would range from 0.25-4.1 mg/l. These areas of higher concentrations, while representing less than 10 percent of the total area of the estuary, could result in a significant impact.

Flood Plains

No improvements would be constructed within the flood plain. Implementation of this Alternative would not result in significant impacts to the flood plain. Consequently, implementation of this alternative would be consistent with Executive Order 11988, "Flood Plain Management" (42 Fed. Reg. 26951 (1997)).

Mitigation Measures

Potential significant impacts to surface and groundwater from discharge to groundwater of treated effluent at the Lemon Grove ponds were identified. In order to avoid this impact, the following mitigation measure would be included in Alternative 1:

The discharge of treated effluent to groundwater at the Lemon Grove ponds shall be conducted in accordance with a monitoring plan conducted by MCB Camp Pendleton and approved by RWQCB, and would contain the following:

1. Five years of monitoring and reporting of surface and ground water quality in open water areas and the salt water marsh north and northwest of the Lemon Grove Ponds, for compliance with Basin Plan Mineral Objectives contained in Table 4-1, and for nitrogen and phosphorous in the salt water marsh (including in the estuary west of I-5).

2. Quantification of environmental and biological conditions in the adjacent salt water marsh and Santa Margarita River estuary:

   A. Parameters
   - Water column nutrients: nitrate (NO_3), ammonia (NH_4), total Kjeldahl nitrogen (TKN), total phosphorous (TP), phosphate (PO_4).
   - Water temperature, dissolved oxygen (DO), pH, salinity, turbidity, chlorophyll concentration.
   - Salt Water Marsh vegetation (species composition, percent cover, biomass, tissue nutrients).

   B. Stations:
   - One upstream of the discharge.
   - At least three downstream stations: one in the nearest salt water marsh and one in the nearest open water east of I-5; and one in the estuary west of I-5.

   C. Sampling frequency
   - Monthly for basic water quality and flow.
   - Quarterly for biological sampling and water column nutrients.

4.1.2 Alternative 2: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains plus Advanced Wastewater Treatment and Reclamation of a Portion of the Effluent (Preferred Alternative)

Surface Water Quality

Disposal of the total combined effluent through gravity injection would eliminate the existing surface water discharge of effluent which exceeds permitted limits for certain constituents. Therefore, implementation of Alternative 2 would be beneficial to surface water quality.

Groundwater modeling was conducted to evaluate the design of the basins to optimize percolation and to minimize the potential for effluent surfacing and related impacts to surface water quality.

Based on this study, project plans for disposal at the Lemon Grove ponds were revised to case the vertical drains, and discharge the treated effluent directly into the groundwater, i.e., gravity injection. The revised pond and drain design would essentially eliminate percolation from the ponds and the lateral flow of undiluted effluent, and thus avoid significant impacts to surface water quality.

Based on preliminary data from this model, approximately 90 percent of this 3 MGD (i.e., approximately 2.7 MGD) would flow through high conductivity terrace deposits under the developed Camp Del Mar area and southwest to the ocean, rather than northwest through the low permeability river deposits toward the estuary. The remaining 10 percent, or approximately 300,000 gallons/day, would be added to the existing groundwater flow beneath the estuary. Predicted groundwater elevations, based on the modeling, are shown in Figure 4-1. Surfacing of groundwater in the river would occur only if groundwater elevations exceeded ground elevations at the bluff, and would be a small fraction of the approximate 300,000 gallons per day of groundwater flow in the west and northwest directions.

Currently MCB Camp Pendleton discharges approximately 1.5 MGD of secondary effluent from STP 13 directly into the Santa Margarita River above the estuary. This secondary effluent contains an average of 21 mg/liter of total nitrogen. Initial model results indicate that, with implementation of Alternative 1, total nitrogen concentrations in groundwater as a result of effluent discharged to the water table would have a concentration of less than 1 mg/liter at the river and approximately 1 mg/liter where it discharges at the ocean. Predicted groundwater nitrate concentrations, based on the modeling, are shown in Figure 4-2.

Based upon initial results of the modeling conducted for nitrogen concentrations, total phosphorous concentrations in ground water as a result of effluent discharged to the water table would have a concentration of less than 0.25 mg/l in the vicinity of the river and approximately 0.25 mg/l where it discharges to the ocean. Therefore, the total phosphorous composition would be significantly reduced from the 5.8 mg/l currently being discharged into the Santa Margarita River from STP 13.

Therefore, the large volume of secondary effluent currently continuously discharging into the river channel would be eliminated. A relatively small volume of groundwater containing diluted effluent may periodically surface in the river channel. The net effect from the reduced volume of discharged effluent would be beneficial to surface water quality. Further, the total nitrogen composition of any discharge would be significantly reduced. In order to assure that potentially significant impacts are avoided, the surface water would be monitored in accordance with a program that would be approved and permitted by the cognizant resource agencies.

Groundwater Quality

Basin Plan

As noted in Section 3.1, the Basin Plan establishes numerical groundwater quality objectives for the portion of the Ysidora HA which is east of the easterly boundary of I-5. Previously, the RWQCB deleted the beneficial uses and groundwater objectives for the coastal area west of the easterly boundary of I-5. Because the Lemon Grove ponds and vertical drains would be located immediately east of this boundary, and there is no current utilization of groundwater in the area, application of the groundwater quality objectives west of I-5 would be requested. Table 4-1 compares the projected quality of effluent discharge with postulated average groundwater quality in the Lemon Grove vicinity, and with Basin Plan groundwater quality objectives. As shown in Table 4-1, the proposed discharge is projected to be of significantly better quality than existing groundwater in the vicinity of Lemon Grove. With the exception of TDS, the reclaimed water discharge also would be superior in quality to the Basin Plan groundwater quality objectives that apply east of I-5. The groundwater in the vicinity of Lemon Grove is of such poor quality and high salinity that future beneficial use of the groundwater is highly improbable (even with groundwater demineralization). Implementation of Alternative 2 would improve the overall groundwater quality, although the concentration of one constituent, TDS, would exceed the Basin Plan objective at the discharge point, the impact to water quality would not be significant.

Potable Water Sources

No actual groundwater use for potable supply now occurs, or is anticipated to occur, within 3.7 miles of the Lemon Grove discharge site. Further, the nearest wells are located upgradient and upstream from the pond site. Therefore, there would not be any significant impacts to potable water sources.

The discharge of up to 3.6 MGD of effluent to the groundwater in the Lemon Grove area would provide a barrier to reduce the saltwater intrusion into the upstream groundwater. This impact would be beneficial, providing enhanced protection of potable water sources.

Estuary

Replacement of the current surface water discharge from STP 13 with groundwater discharges under this alternative would benefit the downstream estuary by: 1) decreasing freshwater influences on the estuary during summer and autumn months; and 2) limiting the quantity of nutrients discharged to the estuary. This would result in more natural conditions in the estuary, under which freshwater

flows reach the estuary only during periods of significant natural runoff. Modeling indicated that groundwater will likely discharge to the surface north and northwest of the ponds, as evidenced by projected groundwater elevation contours that are greater than topographic elevations (Figure 4-1). Predicted nitrate concentrations at these locations range from 1-15 mg/l (Figure 4-2). Phosphorous concentrations would range from 0.25-4.1 mg/l. These areas of higher concentrations, while representing less than 10 percent of the total area of the estuary, could result in a significant impact.

Flood Plains

No improvements would be constructed within the flood plain. Implementation of this Alternative would not result in significant impacts to the flood plain. Consequently, implementation of this alternative would be consistent with Executive Order 11988, "Flood Plain Management" (42 Fed. Reg. 26951 (1997)).

Mitigation Measures

Mitigation measures would be the same as for Alternative 1, including the monitoring of surface and groundwater quality and biological parameters in the river and estuary.

4.1.3 Alternative 3: Tertiary Treated Effluent Blended with Secondary Effluent for Groundwater Recharge at Ysidora Flats

Environmental Impacts

Surface Water Quality

There would be a potential for adverse impacts to surface water quality impacts at Ysidora Flats in that certain constituents could have concentrations exceeding the Basin Plan objectives for surface water, and nutrient concentrations would be expected to exceed the Basin Plan objectives for surface water. There is also the potential for observable nitrogen toxicity from ammonia or other toxicants. The concentration of effluent discharged to the river would vary, not only with the treatment efficiency, but with the relative quantities of tertiary and secondary treated effluents. The tertiary treated effluent from STP 13, would constitute the greater part of the discharge, and may meet the Basin Plan criteria; the addition of the secondary effluent from STPs 1, 2, 3 and 8 would result in a mixture which would exceed the criteria for nitrogen, phosphorous and TDS. Alternative 3 differs from Alternative 2 in that there would not be any enhancement of the percolation capabilities of the Lemon Grove ponds. Therefore, if unacceptable surface water quality at Ysidora Flats required the

diversion of the STP 1, 2, 3, and 8 effluent to Lemon Grove, the storage/percolation capacity would be limited, although storage would only be required for the secondary effluent. The potential impact at Ysidora Flats would be less than significant since the discharge would be designed to recharge the groundwater in a manner which would benefit the restored wetland habitat. This discharge would be planned, monitored, and permitted in accordance with a program which would be approved by the cognizant resource agencies.

Groundwater Quality

Basin Plan

The potential for adverse impacts to groundwater quality with the discharge of effluent at the Ysidora Flats mitigation area would be similar to those described for surface water quality, in that concentrations of certain constituents would exceed the Basin Plan criteria for groundwater recharge. Mitigation of impacts to a level less than significant would be through implementation of an approved and permitted monitoring program.

Potable Water Sources

No use of groundwater for potable supply now occurs, or is anticipated to occur, within approximately 1.5 miles of the Ysidora Flats discharge site. Further, the nearest wells are located upgradient and upstream from the discharge site. Therefore, there would not be any adverse water quality impacts to potable water sources.

Estuary

The tertiary effluent discharged at Ysidora Flats during the dry seasons would be absorbed locally and would not reach the estuary. During a wet season, effluent discharges may reach the estuary by inclusion into surface waters flowing in the Santa Margarita River. The discharge would be diluted by the river water, and the impact on the estuary would be less than significant.

Currently MCB Camp Pendleton discharges approximately 1.5 MGD of secondary effluent from STP 13 directly into the Santa Margarita River above the estuary. This secondary effluent contains an average of 21 mg/liter of total nitrogen. The total phosphorous currently being discharged into the Santa Margarita River from STP 13 is 5.8 mg/l. With implementation of Alternative 3, the large volume of secondary effluent currently discharging into the river channel would be eliminated. The net effect from the cessation of discharging effluent would be beneficial.

Flood Plains

All improvements at Ysidora Flats would be built within the 100-year flood plain, and would be subject to damage or loss during a severe flood. The damage could result in the inability to discharge effluent to Ysidora Flats. A short-term loss of the dechlorination or discharge system may not result in a significant impact, as the discharge through Lemon Grove or directly to the river would likely be highly diluted during flood conditions, and concentrations of effluent constituents would be below permit limits. A long-term outage would likely result in the filling of effluent storage facilities and subsequent live stream discharge of effluent which exceeded permit limits. This discharge would be a significant water quality impact. The potential significant impact could be avoided by the demonstration of the ability to replace a dechlorination system or discharge facilities within a reasonable period of time following flood damage.

Since the goal of the proposed discharge at Ysidora Flats is to provide additional groundwater for the wetland mitigation site, the construction of improvements to discharge tertiary effluent from the five STPs within the flood plain is the only practicable alternative to enable such discharge to benefit the wetland mitigation site. Accordingly, implementation of this alternative would be consistent with Executive Order 11988, "Flood Plain Management" (42 Fed. Reg. 26951 (1997)), as it would be designed to minimize potential harm to or within the flood plain.

Mitigation Measures

Potential significant impacts to surface and groundwater from effluent discharges in the Ysidora Flats area were identified. In order to avoid a significant impact the following mitigation measure would be included in Alternative 3:

1. The discharge of tertiary treated effluent to the Santa Margarita River at Ysidora Flats shall be designed and implemented as prescribed in an NPDES permit. A monitoring plan for a discharge at Ysidora Flats could contain the following (Montgomery Watson 1998):
   A. A monitoring of surface flow to identify how far downstream the effluent travels before percolating into the riverbed.

   B. Quantification of environmental and biological conditions:

      1) Parameters
         - Water column nutrients: nitrate (NO_3), ammonia (NH_4), total Kjeldahl nitrogen (TKN), total phosphorous (TP), phosphate (PO_4).
         - Water temperature, dissolved oxygen (DO), pH, salinity, turbidity, chlorophyll concentration.

- Algal community (species composition, and for each species percent cover, biomass, tissue nutrients).
- Riparian vegetation (species composition, percent cover, biomass, tissue nutrients).
- Fish and invertebrates (species composition, species diversity, biomass).

2) Stations:
   - One upstream of the discharge. This flow is anticipated to be zero in dry weather.
   - At least two downstream stations, with indication of how far downstream surface flow appears.

3) Sampling frequency
   - Monthly for basic water quality and flow.
   - Quarterly for biological sampling and water column nutrients.

4) Significance criteria
   - dissolved oxygen drops below acceptable limits: 5.0 mg/L or some increment below natural upstream DO levels.
5) Mitigation measures if significance criteria are exceeded
   - For DO, construct cascade or other aeration method for effluent.

2. The Marine Corps shall provide spare parts for the Ysidora Flats discharge system and procedures which would enable the replacement of a damaged system within 30 days of the loss of the system.

4.1.4 <u>Alternative 4: Advanced Wastewater Treatment and Discharge in Cased Wells at Lemon Grove</u>

Environmental Impacts

<u>Surface Water Quality</u>

With implementation of Alternative 4, similar to Alternative 1, disposal of the total effluent through enhanced percolation would eliminate the existing surface water discharge of effluent which exceeds permitted limits for certain constituents. Therefore, implementation of Alternative 4 and elimination of the current surface discharge would be beneficial to surface water quality. For Alternative 4, there would not be any significant potential for "surfacing" of subsurface flow, and no potential significant impact.

Groundwater Quality

Basin Plan

The quality of effluent discharged with implementation of Alternative 4 would be better than the secondary effluent of Alternative 1 and, as described in Section 4.1.1, the proposed discharge for Alternative 1 is projected to be of significantly better quality than existing groundwater in the vicinity of Lemon Grove. With the exception of TDS, the reclaimed water discharge also would be superior in quality to the Basin Plan groundwater quality objectives that apply east of I-5. The groundwater in the vicinity of Lemon Grove is of such poor quality that future use of the groundwater is highly improbable (even with groundwater demineralization). Implementation of Alternative 4 would improve the groundwater quality, although the concentration of one constituent, TDS, would exceed the Basin Plan objective at the discharge point. The impact would not be significant.

Potable Water Sources

No actual groundwater use for potable supply now occurs, or is anticipated to occur, within 3.7 miles of the Lemon Grove discharge site. Further, the nearest wells are located upgradient and upstream from the discharge sites. Therefore, there would not be any adverse water quality impacts to potable water sources.

The discharge of up to 3.6 MGD of effluent to the groundwater in the Lemon Grove area would provide a barrier to reduce the saltwater intrusion into the upstream groundwater. This impact would be beneficial, providing enhanced protection of potable water sources.

Estuary

The effects of Alternative 4 would be similar to those of Alternative 1. There would not be any significant impact.

Flood Plains

No improvements would be constructed within the flood plain. Implementation of this Alternative would not result in significant impacts to the flood plain. Consequently, implementation of this alternative would be consistent with Executive Order 11988, "Flood Plain Management" (42 Fed. Reg. 26951 (1997)).

Mitigation Measures

No significant impacts to hydrology or water quality were identified for this alternative; no mitigation measures would be required.

4.1.5 Alternative 5: Advanced Wastewater Treatment with Irrigation of Agricultural Fields and Discharge in Cased Wells

Environmental Impacts

Surface Water Quality

The effects of Alternative 5 would be the same as those of Alternative 4. There would not be any significant impact.

Groundwater Quality

The present land use is crop production, principally cucumbers, tomatoes, and potatoes. The groundwater used for irrigation would be treated to comply with the Title 22 standards for irrigation of food crops of this type without creation of a risk to human health. Treatment would include disinfection to MPN 2.2 coliforms per 100 ml. Salt tolerance for these crops is shown in Table 4-2. Projected effluent TDS is approximately 908 mg/L (Montgomery Watson 1998). It may be seen from the table that no yield reduction would occur for cucumbers and tomatoes, and a yield reduction of less than ten percent may occur for potatoes. There may be no yield reduction if the existing irrigation water has TDS in 900 mg/L range, as indicated in samples of well 35K1, Table 3-5. To prevent buildup of salts in the soil, it may be necessary to over-irrigate at times to leach the salts past the soil root zone. This is common practice in the west, where both soils and waters tend to be saline or alkaline or both (Montgomery Watson 1998 and Almgren & Koptionak 1989). The impact to groundwater quality for irrigation would not be significant.

Effluent not used for irrigation would be discharged through cased wells. The impact of discharge through cased wells would be the same as that for Alternative 4.

Table 4-2
Crop Salt Tolerance

Crop	TDS Limitation (mg/L)	
	No yield reduction	10 percent yield reduction
Cucumbers	1100	1408
Tomatoes	1100	1472
Potatoes	704	1100

Montgomery Watson 1998 and Almgren & Koptionak 1989

Estuary

The effects of Alternative 5 would be the same as those of Alternative 4. There would not be any significant impact.

Flood Plains

No improvements would be constructed within the flood plain. Implementation of this Alternative would not result in significant impacts to the flood plain. Consequently, implementation of this alternative would be consistent with Executive Order 11988, "Flood Plain Management" (42 Fed. Reg. 26951 (1997)).

Mitigation Measures

No significant impacts to hydrology or water quality were identified for Alternative 5; no mitigation measures would be required.

4.1.6 No Action Alternative

Environmental Impacts

With the No Action Alternative, there would not be any construction of vertical drains, AWT plants, cased wells, or discharge systems as described in the proposed action alternatives. Effluent would be conveyed to the ponds at Lemon Grove in the system now being constructed. Disposal would be by evaporation. The rate of effluent generation would exceed the evaporation rate, and the Lemon Grove

ponds would fill. Effluent could be stored at or near the individual plants in the ponds now used for storage and percolation and planned for abandonment. When all storage ponds would be full, excess effluent would be discharged to the Santa Margarita River adjacent to the Lemon Grove ponds.

Surface Water Quality

The No Action Alternative would eliminate surface water discharge of effluent at the discharge points for STPs 1, 2, 3, and 8. This action would be beneficial to surface water quality upstream of Lemon Grove. The potential discharge of secondary effluent at Lemon Grove, which would occur when effluent production would exceed the available storage and discharge capacity, would be in violation of the limits of the current NPDES permit (Order No. 94-51), and would be a significant adverse impact.

Groundwater Quality

Under the No Action Alternative, the percolation volumes would be less than for Alternatives 1, 2 and 4; however, effects on groundwater quality would be similar to those described in Alternative 1.

Estuary

There would be a potential for adverse impacts to the estuary with the No Action Alternative, as all effluent in excess of evaporation and storage capabilities would be discharged to surface waters closer to the estuary than the current discharge points. Therefore, there would potentially be more effluent reaching the estuary, adversely effecting the estuarine environment.

Flood Plains

No improvements would be constructed within the flood plain. Therefore, there would not be any significant impacts.

Mitigation Measures

As a result of the conveyance of effluent from STPs 1, 2, 3, and 8 to Lemon Grove, the No Action Alternative would result in better upstream surface water and ground water quality due to the discharge of secondary effluent downstream of the previous discharge points. However, mitigation measures would be necessary to reduce the remaining significant impacts. The No Action Alternative would result in continued violation of the Basin Plan.

4.2 CULTURAL RESOURCES

4.2.1 Alternative 1: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains

Environmental Impacts

No cultural resources were identified within the Lemon Grove study area, which is the area which would be disturbed by implementation of Alternative 1. There would not be any significant impacts.

Mitigation Measures

No cultural resources impacts were identified and no mitigation measures would be required.

4.2.2 Alternative 2: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains plus Advanced Wastewater Treatment and Reclamation of a Portion of the Effluent (Preferred Alternative)

Environmental Impacts

Phase 1 of Alternative 2 would be identical to Alternative 1, and there would not be any cultural resources impacts. Implementation of Phase 2 of Alternative 2 would result in disturbance within the STP 2 area. No cultural resources were identified. Therefore, there would not be any significant impacts.

Mitigation Measures

No cultural resources impacts were identified and no mitigation measures would be required.

4.2.3 Alternative 3: Tertiary Treated Effluent Blended with Secondary Effluent for Groundwater Recharge at Ysidora Flats

Environmental Impacts

Implementation of Alternative 3 would result in disturbance to the AWT area near STP 13, the pipeline corridor from STP 13 to Ysidora Flats and the discharge area within Ysidora Flats. No significant cultural resources were identified within the AWT area or the discharge area. However,

as described in Section 3.2, significant cultural resources were found along the pipeline corridor. Installation of a parallel pipeline would result in potential significant impacts to cultural resources.

Mitigation Measures

Prior to implementation of Alternative 3, a historic properties treatment plan would be prepared and submitted to the SHPO. The plan would address preconstruction testing of known archaeological sites, treatment of sites eligible for the National Register of Historic Places, a construction monitoring program, and treatment of newly discovered sites; as well as Native American involvement and a program for dealing with inadvertent discoveries under the Native American Graves Protection and Repatriation Act (NAGPRA). Appendix E contains the letter of concurrence from the SHPO.

4.2.4 Alternative 4: Advanced Wastewater Treatment and Discharge in Cased Wells at Lemon Grove

Environmental Impacts

Implementation of Alternative 4 would result in disturbance to the AWT area near STP 13 and the Lemon Grove Pond area. No cultural resources were identified in these areas, and there would not be any significant impacts.

Mitigation Measures

No cultural resources impacts were identified and no mitigation measures would be required.

4.2.5 Alternative 5: Advanced Wastewater Treatment with Irrigation of Agricultural Fields and Discharge in Cased Wells

Environmental Impacts

Implementation of Alternative 5 would result in disturbance to the AWT area near STP 13, the Lemon Grove Pond area, and the designated pipeline corridor from the AWT area to the irrigation reservoirs. No cultural resources were identified in the AWT or Lemon Grove areas. Although, the pipeline corridor would be entirely within existing roadways and no significant cultural resource have been identified, there would be a possibility for the occurrence of buried cultural resources.

Mitigation Measures

An archaeological monitor would be present during construction of the pipeline. Prior to implementation of Alternative 5, a historic properties treatment plan would be prepared and submitted to the SHPO. The plan would address preconstruction testing of known archaeological sites, treatment of sites eligible for the National Register of Historic Places, a construction monitoring program, and treatment of newly discovered sites; as well as Native American involvement and a program for dealing with inadvertent discoveries under the Native American Graves Protection and Repatriation Act (NAGPRA). Appendix E contains the letter of concurrence from the SHPO.

4.2.6 No Action Alternative

Environmental Impacts

With the No Action Alternative, there would not be any construction of vertical drains, AWT plants, cased wells, or discharge systems as described in the proposed action alternatives. Therefore, there would not be any additional potential cultural resources impacts not previously discovered in the FEIS/R.

Mitigation Measures

With the No Action Alternative, there would not be any potential impacts, therefore, no mitigation measures would be necessary.

4.3 BIOLOGICAL RESOURCES

This impact discussion is a summary from the Supplemental Biological Technical Report in Appendix B.

4.3.1 Alternative 1: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains

Environmental Impacts

Vegetation Communities

Because the ponds at Lemon Grove are currently under construction as described in the FEIS/R, there would not be any additional direct impacts to vegetation communities from this alternative.

Sensitive Plant Species

No sensitive plant species were identified at this site as described in the FEIS/R; therefore, no direct impacts to sensitive plant species would result from this alternative.

A salt marsh is located at the toe of the bluffs at the northern boundary of the Lemon Grove site. If effluent from the proposed ponds with vertical drains reaches the salt marsh, this community could be impacted by altered salinity. Large influxes of fresh water could decrease the salinity of the salt marsh, potentially altering the species composition. Changes in the composition of the salt marsh could potentially be a significant impact depending upon the extent of changes. In order to avoid this potentially significant impact, cased vertical drains have been incorporated into the design of the Lemon Grove pond area, as described in Section 2.2.1, and shown in Figure 2-8.

Sensitive Animal Species

Since the ponds at Lemon Grove are currently under construction as described in the FEIS/R, there would not be any additional direct impacts to sensitive animal species (e.g. the coastal California gnatcatcher) from this alternative.

Potential effects on groundwater levels, and indirect effects on riparian vegetation dependent upon groundwater, are addressed in more detail in the Programmatic Groundwater and Riparian Habitat Assessment and the Riparian BA. The Programmatic Groundwater and Habitat Assessment found that, during drought years, groundwater decline from effluent withdrawal could have a potential effect on the riparian habitats surrounding STP 3. Although this finding was based on groundwater modeling, the scope of the study did not allow for quantification of these impacts.

Mitigation Measures

Best Management Practices

The following general mitigation measures would apply to all construction activities. These measures are standard Best Management Practices (BMPs) to prevent environmental degradation during construction.

1. Provision would be made to inform the construction contractor(s) about the biological constraints of this project. All sensitive habitat areas to be avoided would be clearly marked on project maps provided to the contractor. These areas would be designated as "no construction" zones. These areas would be flagged by the project biologist prior to the onset of construction activities. In some cases, resources would be fenced or otherwise protected from direct or indirect impacts.

2. A contractor education program would be implemented to ensure that contractors and all construction personnel are fully informed of the biological resources associated with this project. This program would focus on: (a) the purpose for resource protection; (b) contractor identification of sensitive resource areas in the field (e.g., areas delineated on maps and by flags or fencing); (c) sensitive construction practices (see numbers 3 through 10, below); (d) protocol to resolve conflicts that may arise at any time during the construction process; and (e) ramifications of noncompliance. This program would be conducted by a qualified biologist, and would be a requirement for all construction supervisory personnel.

3. Activities within drainages or other wetland areas (other than in the construction zone), include staging areas, equipment access, and disposal or temporary placement of excess fill, would be prohibited.

4. Vehicles would use existing access roads to the degree feasible. Where new access is required, all vehicles would use the same route. All access routes outside of existing roads or the construction corridor would be clearly marked (i.e., flagged and/or staked) prior to the onset of

construction. All access roads outside of existing roads or the construction corridor would be delineated on the grading plans and reviewed by a qualified biologist.

5. Topsoil would be stockpiled in disturbed areas presently lacking native vegetation. Stockpile areas would be delineated on the grading plans and reviewed by a qualified biologist.

6. Fueling of equipment would take place within existing paved roads and not within or adjacent to drainages or native habitats. Contractor equipment would be checked for leaks prior to operation and repaired as necessary. "No-fueling zones" would be designated on construction maps and would be situated a minimum distance of 50 feet from all drainages.

7. Construction in or adjacent to sensitive areas would be appropriately scheduled to avoid potential impacts to biological resources.

8. Erosion and siltation of offsite areas during construction would be minimized. An erosion control plan would be required of the contractor. The project engineer would be responsible for ensuring that the erosion control plan is developed and implemented. The plan would include the use of hay bales, silt fences, siltation basins, and other devices necessary to stabilize the soil in denuded or graded areas during the construction and revegetation phases of the project.

9. A site restoration plan would be prepared and implemented for all areas where vegetation would be temporarily removed for construction. The plan would detail appropriate plant mixes and methods for reestablishing native vegetation consistent with pre-existing vegetation communities. Plan preparation would be coordinated with the USFWS and the Camp Pendleton Assistant Chief of Staff, Environmental Security (AC/S ES), Land Management Branch.

Resource-Specific Mitigation Measures

Coastal California Gnatcatcher

Potential indirect noise impacts to coastal California gnatcatcher from ambient noise levels within the species' nesting habitat would be avoided through timing of construction and monitoring. Installation of the drains would begin at the north end of the pond site nearest existing potential gnatcatcher habitat and would continue from north to south so that boring activity would move away from the habitat area and to minimize the potential for disruption to gnatcatchers arriving early in the breeding season.

Least Bell's Vireo

Monitoring and mitigation measures for potential loss of riparian habitat due to groundwater decline downstream of STP 3 are described in the Programmatic Groundwater/Riparian Habitat Assessment and the Biological Opinion for Base-wide riparian resources. This includes frequent monitoring of groundwater wells and vegetation transects upstream and downstream from STP 3 for at least five years. Monitoring for groundwater decline would include the assessments of depth to water, vegetation health and vigor, and vegetation cover. A detailed monitoring plan will be developed by the Base to include these measures, which are further detailed in the Programmatic Groundwater and Riparian Assessment. It also includes an intensive exotic species control program, particularly the control of giant reed (*Arundo donax*).

4.3.2 Alternative 2: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains plus Advanced Wastewater Treatment and Reclamation of a Portion of the Effluent (Preferred Alternative)

Environmental Impacts

Vegetation Communities

Development of Phase 1 of Alternative 2 would not result in impacts to vegetation communities. Phase 2 would directly impact approximately 1.0 acre of ruderal habitat from the construction of an equalization basin and an advanced wastewater treatment facility, both at STP 2. The proposed dechlorination facility would be within the disturbed area at STP 2. Therefore, no additional impacts to habitat would occur from this facility.

The new connection from the existing STP 1 pipeline would be trenched from the southern end of the Rodeo Grounds to STP 2. The ten-inch force main pipeline would cross Pilgrim Creek at the north end of STP 2 where three 48-inch diameter culverts are located within the creek. No wetland vegetation occurs within the boundaries of the dirt road which presently crosses the creek at the existing culverts. The ten-inch force main would be trenched, jacked and bored beneath the culverts and approximately eight feet beneath the surface of the dirt road to avoid any impacts to sensitive vegetation.

For purposes of this analysis it was assumed that a disturbance width of up to 40 feet would be necessary for most of the route. This 40-foot disturbance width would not be required at the existing Pilgrim Creek road crossing, thus impacts to the riparian vegetation would be avoided. Additionally,

along the southwestern border of STP 2, the pipeline would be constructed from STP 2 by temporarily removing the boundary fence. Approximately 1.3 acres of disturbed and ruderal habitat and 0.02 acre of mulefat scrub would be temporarily impacted by construction of the pipeline. Over a short amount of time that these communities would recover to their former state. None of these temporary impacts would be significant.

Construction of a valve in the existing pipeline adjacent to Ysidora Flats would not impact any habitat and no construction of an outfall is proposed by Alternative 2. Potential cumulative impacts from future installation of an outfall at this location are addressed in Section 5.0 of this FSEIS.

Sensitive Plant Species

There would not be any direct impacts to sensitive plant species from Alternative 2 because no sensitive plant species were identified at the Lemon Grove pond site and no sensitive plant species were previously identified at STP 2.

Sensitive Animal Species

No sensitive animal species have been identified at STP 2 as described in the FEIS/R. As such, there would not be any direct impacts to sensitive animal species from that portion of Phase 2 built at STP 2. No direct impacts would occur from construction of the dechlorination facility, because the facility would be sited at STP 2.

No direct impacts to sensitive animal species would occur from the construction of the pipeline to connect the STP 1 effluent pipeline to STP 2.

Construction activities near Pilgrim Creek would be monitored to avoid indirect noise impacts to potential nesting species near the creek crossing. The 0.02 acre of mulefat scrub that would be impacted by the pipeline is not considered adequate breeding habitat for any sensitive animal species, therefore, no direct impacts would occur in that area.

Since the ponds at Lemon Grove are currently under construction as described in the FEIS/R, there would not be any additional direct impacts to sensitive animal species (e.g. the coastal California gnatcatcher) from this alternative.

Potential effects on groundwater levels, and indirect effects on riparian vegetation dependent upon groundwater, are addressed in more detail in the Programmatic Groundwater and Riparian Habitat

Assessment and the Riparian BA. The Programmatic Groundwater and Habitat Assessment found that, during drought years, groundwater decline from effluent withdrawal could have a potential effect on the riparian habitats surrounding STP 3. Although this finding was based on groundwater modeling, the scope of the study did not allow for quantification of these impacts.

Mitigation Measures

The BMPs for Alternative 2 would be the same as for Alternative 1 at the Lemon Grove Pond site.

<u>Resource-Specific Mitigation Measures</u>

Least Bell's Vireo and Southwestern Willow Flycatcher

Potential indirect noise impacts to least Bell's vireo and southwestern willow flycatcher from ambient noise levels within the species' nesting habitat would be avoided through monitoring of construction.

Coastal California Gnatcatcher

Potential indirect noise impacts to coastal California gnatcatcher from ambient noise levels within the species' nesting habitat would be avoided through timing of construction and monitoring. Installation of the drains would begin at the north end of the pond site nearest existing potential gnatcatcher habitat and would continue from north to south so that boring activity would move away from the habitat area and to minimize the potential for disruption to gnatcatchers arriving early in the breeding season.

Monitoring and mitigation measures for potential loss of riparian habitat due to groundwater decline downstream of STP 3 are described in the Programmatic Groundwater/Riparian Habitat Assessment and the Biological Opinion for Base-wide riparian resources. This includes frequent monitoring of groundwater wells and vegetation transects upstream and downstream from STP 3 for at least five years. Monitoring for groundwater decline would include the assessments of depth to water, vegetation health and vigor, and vegetation cover. A detailed monitoring plan will be developed by the Base to include these measures, which are further detailed in the Programmatic Groundwater and Riparian Assessment. It also includes an intensive exotic species control program, particularly the control of giant reed (*Arundo donax*).

4.3.3 Alternative 3: Tertiary Treated Effluent Blended with Secondary Effluent for Groundwater Recharge at Ysidora Flats

Environmental Impacts

The discharge of tertiary treated effluent from STP 13, blended with secondary treated effluent from STPs 1, 2, 3, and 8, at the Ysidora Flats area would be potentially beneficial, as it would allow greater reuse of effluent. The effluent would provide groundwater recharge and additional water for the restoration of riparian habitat. Potential impacts to biological resources from large quantities of effluent and nitrogen/phosphorus loading would be monitored, as described in the BMPs below.

Vegetation Communities

Construction of the AWT Plant at STP 13 would impact 0.6 acre of non-native grassland and 0.4 acre of developed area. These impacts would not be significant. Construction of the outfall at Ysidora Flats would not permanently impact any habitat as the existing pipe would be used to convey effluent. The outfall structure would be placed in the disturbed area of Ysidora Flat to avoid impacts to riparian vegetation. However, the added effluent surplus could potentially have an impact on the recruited riparian vegetation within the mitigation area. The added water could potentially create freshwater marsh habitat in the mitigation area or convert recruited riparian habitat into freshwater marsh. According to USACOE permits for the BRAC and Levee projects, only successful recruitment of wetlands and riparian habitats are considered acceptable impact mitigation. Multiple discharge points would be installed to dissipate effluent over a larger area and avoid scour impacts to the mitigation area. This potential significant impact would be monitored.

Sensitive Plant Species

No sensitive plant species were previously identified within the Lemon Grove ponds in the FEIS/R. No sensitive plant species were identified during the survey of STP 13 and none would be expected to occur on this site. No sensitive plant species were previously reported from the Ysidora Flats site as described in the FEIS/R. Therefore, no direct impacts to any sensitive plant species would occur from Alternative 3.

Sensitive Animal Species

The ponds at Lemon Grove are currently under construction. There would not be any additional direct impacts to sensitive animal species (e.g., the coastal California gnatcatcher) from this alternative that have not already been described in the FEIS/R.

No sensitive animal species were observed during the survey of STP 13. Therefore, there would not be any direct impacts to sensitive animal species from construction of the AWT facility at STP 13.

No direct impacts would occur from construction of the dechlorination facility and outfall.

The outfall structure would not impact any riparian habitat, as this structure would be located in a disturbed area. Although no arroyo southwestern toads occur within the project area, it is likely that the BRAC/Levee projects' mitigation site will create habitat for this federally endangered species. The discharge of surplus treated effluent into the mitigation site could create potential breeding ponds for the arroyo southwestern toads downstream from the discharge points.

Indirect impacts could arise from the discharge of effluent at the BRAC/Levee mitigation area at Ysidora Flats. Indirect impacts from the increased effluent discharge and increased nutrient loading could adversely affect the habitat being created. Discharge of too much effluent could convert the mitigation area from willow woodland to freshwater marsh. Similarly, increasing the nutrients on the site could shift the competitive balance from native species to non-native species. Conversion of habitat type and/or increasing the presence of non-native species as a result of effluent discharge would be a significant impact.

Mitigation Measures

In addition to the BMPs and the timing of construction during coastal California gnatcatcher (at STP 13), least Bell's vireo (at STP 13 and Ysidora Flats) and southwestern willow flycatcher (at Ysidora Flats) breeding seasons discussed for Alternative 2, the following additional mitigation measures for effluent discharge at Ysidora Flats would be implemented for Alternative 3:

1. The discharge of tertiary treated effluent to the Santa Margarita River at Ysidora Flats shall be designed and implemented as allowed in an appropriate NPDES in accordance with the mitigation measure for Hydrology and Water Quality Impacts in Section 4.1.2.

2. In accordance with the Biological Opinion (BO 1-6-95-F-02) for Programmatic Activities in Riparian and Estuarine/Beach Ecosystems on Camp Pendleton (USFWS 1995a), the mitigation site at Ysidora Flats would be designed and monitored in conjunction with long-term monitoring programs for the BRAC/Levee projects:

   A. The proposed outfall or discharge system would be designed such that water would be evenly distributed over the mitigation site to avoid creation of ponded areas and freshwater marsh at the discharge point(s).

   B. Hydrology (groundwater and surface water) would be monitored to determine hydrological adequacy for the establishment of a riparian wetlands ecosystem. Hydrological adequacy would be evaluated according to the performance criteria of the draft Santa Margarita Hydrogeomorphic (HGM) guidebook established for the mitigation site. Monitoring results would be included in annual monitoring reports for the BRAC/Levee mitigation projects.

   C. Nutrient content in soil and water would be monitored to determine chemical adequacy for the establishment of a riparian wetlands ecosystem. Adequacy of nutrient content would be evaluated according to the performance criteria of the draft Santa Margarita HGM guidebook established for the mitigation site. Monitoring results would be included in annual reports for the BRAC/Levee mitigation projects.

   D. Species recruitment would be monitored for five years following the outfall installation and evaluated against the riparian ecosystem establishment criteria (according to the draft Santa Margarita HGM guidebook). Monitoring results would be included in annual reports for the BRAC/Levee mitigation projects.

   E. Exotic invasive weeds would be monitored and controlled, with the target not to exceed five percent relative cover of the site after five years and twelve consecutive months of monitoring. Monitoring results would be included in annual monitoring reports for the BRAC/Levee mitigation projects.

   F. Potential colonization of arroyo southwestern toads in the area would be monitored. Monitoring results would be included in annual reports for the BRAC/Levee mitigation projects.

   G. Remediation measures would include lowering the effluent volume at the discharge points to prevent the establishment of freshwater marsh habitats in place of willow woodland.

4.3.4 Alternative 4: Advanced Wastewater Treatment and Discharge in Cased Wells at Lemon Grove

Environmental Impacts

Vegetation Communities

Potential impacts to vegetation communities would be similar to the impacts discussed for Alternative 1. Construction of the AWT Plant and equalization basin at STP 13 would impact 0.6 acres of non-native grassland and 0.4 acre of developed area. These impacts would not be significant.

Sensitive Plant Species

No sensitive plant species were previously identified within the Lemon Grove ponds in the FEIS/R. No sensitive plant species were identified during the survey of STP 13, and none would be expected to occur on this site. Therefore, no direct impacts to any sensitive plant species would occur from Alternative 4.

Sensitive Animal Species

The ponds at Lemon Grove are currently under construction. There would not be any additional direct impacts to sensitive animal species (e.g. the coastal California gnatcatcher) from this alternative that have not already been described in the FEIS/R. This impact would not be significant.

No sensitive animal species were observed during the survey of STP 13. Therefore, there would not be any direct impacts to sensitive animal species from construction of the AWT facility and equalization basin at STP 13.

Mitigation Measures

The BMPs would be the same as Alternative 1.

4.3.5 Alternative 5: Advanced Wastewater Treatment with Irrigation of Agricultural Fields and Discharge in Cased Wells

Environmental Impacts

Vegetation Communities

Potential impacts to vegetation communities would be similar to the impacts previously discussed for Alternative 1. Construction of the AWT Plant and equalization basin at STP 13 would impact 0.6 acres of non-native grassland and 0.4 acre of developed area. These impacts would not be significant.

Sensitive Plant Species

No sensitive plant species were previously identified within the Lemon Grove ponds in the FEIS/R. No sensitive plant species were identified during the survey of STP 13 and none would be expected to occur on this site. Therefore, no direct impacts to any sensitive plant species would occur from Alternative 5.

Sensitive Animal Species

The ponds at Lemon Grove are currently under construction. There would not be any additional direct impacts to sensitive animal species (e.g. the coastal California gnatcatcher) from this alternative that have not already been described in the FEIS/R. This impact would not be significant.

No sensitive animal species were observed during the survey of STP 13. Therefore, there would not be any direct impacts to sensitive animal species from construction of the AWT facility and equalization basin at STP 13.

Mitigation Measures

BMPs would be the same as Alternative 1.

4.3.6 No Action Alternative

With the No Action Alternative, there would not be any construction of vertical drains, AWT plants, cased wells, or live stream discharge systems as described in the proposed action alternatives. Effluent would be conveyed to the ponds at Lemon Grove in the system now being constructed. Disposal would be by evaporation. When the Lemon Grove ponds fill and the rate of effluent generation exceeds the evaporation rate, effluent could be stored at or near the individual plants in the ponds now used for storage and percolation and planned for abandonment. When all storage ponds are full, excess effluent would be discharged to the Santa Margarita River adjacent to the Lemon Grove ponds. The No Action Alternative would result in continued violation of the Basin Plan.

Environmental Impacts

Vegetation Communities

No direct impacts to vegetation communities would occur from this alternative.

Indirect impacts would result from lowering the groundwater table at STP 3 which is addressed in the previous FEIS/R and the Programmatic Groundwater/Riparian Habitat Assessment (MCB Camp Pendleton ESO 1995). Indirect impacts to the riparian and wetland (including salt marsh) communities of the lower Santa Margarita River and Estuary could potentially arise from increases in the hydrological regime, decreases in salinity and increases in nitrogen and phosphorus loading. Impacts to salt marsh habitat would be considered significant by the resources agencies.

Sensitive Plant Species

Southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*) is known from the Santa Margarita River Estuary. Indirect impacts, as described above, are not considered significant, as this species occurs across broad environmental gradients. No other sensitive plant species are known to occur within the area of influence for the No Action Alternative.

Sensitive Animal Species

Although changes in the saltmarsh ecosystem would be expected from nutrient loading and a decrease in salinity, no impacts to sensitive wildlife species would occur from the No Action

Alternative. The federal endangered tidewater goby (*Eucycogobius newberryi*) is believed extirpated from the site since floods in 1993 (Swift et al. 1994).

Mitigation Measures

No direct impacts to sensitive plant or wildlife species would occur from implementation of the No Action Alternative. However, potential indirect impacts to salt marsh habitat within the Santa Margarita Estuary from a decrease in salinity and potential nutrient loading, would be mitigated by a long-term monitoring program to include hydrological and soil testing for changes in nutrient and salinity levels, and vegetation and wildlife sampling to note changes in such parameters as species composition and distribution. Potential surface water and estuary habitat impacts could be mitigated by implementation of Alternatives 1, 2, 3, 4, or 5, or a combination thereof which would achieve the purpose and need of the proposed project.

4.4 PUBLIC HEALTH AND SAFETY

4.4.1 Alternative 1: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains

Environmental Impacts

The FEIS/R concluded that the proposed action and alternatives defined in that document would not adversely affect public health and safety within the study area. Since current non-compliance with RWQCB effluent disposal standards is an existing public health and safety concern, implementation of Alternative 1 or other proposed alternatives would have a beneficial effect. In the FEIS/R, short-term construction-related hazards were identified and mitigation measures were recommended to minimize the impact to public health and safety. The potential for the Lemon Grove percolation ponds to become an "attractive nuisance" to children was identified in the FEIS/R as a potential long-term impact. Permanent security fencing would be erected around the ponds, and access to boring holes would be secured when construction workers are not present. In addition, warning signs would be clearly posted to advise people that any contact with water in the ponds is a health danger, per Title 22 of the California Administrative Code.

The current discharge of secondary effluent upstream of potable water supply wells is a public health and safety concern. Implementation of Alternatives 1, 2, 3, 4, or 5 would eliminate this concern, resulting in a beneficial impact.

Mitigation Measures

Best Management Practices

In addition to safety fencing, the BMP recommended in the FEIS/R relative to the less than significant safety impacts in construction areas would be applied to Alternative 1. These BMPs include the following:

1. Erect fencing around the heavy equipment and materials storage area.

2. Place shoring in trenches greater than 5 feet in depth to stabilize trenches.

3. Place markers equipped with flashing lights for night-time use along open trenches at intervals of 30 feet or less.

4. Place flagging or fencing around the perimeter of the trench excavation.

5. Cover all borings to be backfilled with trench plate when construction personnel are not at the site.

6. Schedule major earthwork and heavy machinery use during non-peak hours of travel along affected roadways, whenever possible.

7. Conform trenching operations to U.S. Occupational Safety and Health Administration (OSHA) requirements.

4.4.2 Alternative 2: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains plus Advanced Wastewater Treatment and Reclamation of a Portion of the Effluent (Preferred Alternative)

Environmental Impacts

Potential public health and safety impacts would include those discussed under Alternative 1. Phase 2 includes the operation of advanced wastewater treatment facilities, which would use chlorine gas for effluent disinfection. The operation of industrial facilities, in general, and the use of chlorine gas in particular, are potential health and safety hazards to authorized and unauthorized personnel. The potential impact would be less than significant because authorized personnel would be trained in plant operations, and disinfection by chlorination is an existing process at the STPs. The new facilities would be built within an existing fenced area, thereby reducing the potential impact to unauthorized personnel to less than significant.

Mitigation Measures

BMPs would be the same as those discussed under Alternative 1. No further mitigation would be required.

4.4.3 Alternative 3: Tertiary Treated Effluent Blended with Secondary Effluent for Groundwater Recharge at Ysidora Flats

Environmental Impacts

Potential public health and safety impacts would be the same as those discussed under Alternative 2, except that the proposed tertiary treatment facilities would not be built within an existing fenced area. Therefore, the health and safety hazards to unauthorized personnel would be potentially significant.

Mitigation Measures

BMPs would be the same as those discussed under Alternative 1. In addition, the proposed tertiary treatment facilities shall be enclosed by a security fence.

4.4.4 Alternative 4: Advanced Wastewater Treatment and Discharge in Cased Wells at Lemon Grove

Environmental Impacts

Potential public health and safety impacts would be the same as those discussed under Alternative 2. In addition, this alternative would include an equalization basin which would not be constructed within an existing fenced area, which would be a potential "attractive nuisance" hazard.

Mitigation Measures

BMPs would be the same as those discussed under Alternative 1. Permanent security fencing and signage would also be installed at the advanced wastewater treatment facilities and the equalization basin.

4.4.5 Alternative 5 Advanced Wastewater Treatment with Irrigation of Agricultural Fields and Discharge in Cased Wells

Environmental Impacts

Potential health and safety impacts would be the same as those discussed under Alternative 4. Implementation of Alternative 5 would also result in the use of reclaimed water for irrigation of the

leased agricultural fields. Drinking of this water would pose a public health hazard. There would be a potential adverse impact if irrigation water was consumed by agricultural workers or "others", such as residents of the adjacent Stuart Mesa housing area or military personnel. A wall separates the Stuart Mesa housing area from the agricultural fields, decreasing potential access hazards.

Title 22 of the California Administrative Code requires the posting of signs that warn persons that reclaimed water is non-potable. Warning signs would be clearly posted reducing the potential impact to less than significant.

Mitigation Measures

BMPs would be the same as those discussed under Alternative 1. Permanent security fencing and signage would also be installed at the advanced wastewater treatment facilities and the equalization basin. In addition, warning signs would be written in English, Spanish, and other languages common to agricultural workers and residents of the Stuart Mesa housing area. Prior to conversion of the irrigation system, the Marine Corps would conduct a public information program for the workers, residents, and other personnel considered most likely to gain access to the agricultural fields.

4.4.6 No Action Alternative

Environmental Impacts

With the No Action Alternative, there would not be any construction of vertical drains, AWT plants, cased wells, or discharge systems as described in the proposed action alternatives. Therefore, there would not be any new potential public health and safety impacts. However, the potential impact of the disposal of secondary effluent upstream of potable water sources would remain.

Mitigation Measures

With the No Action Alternative, there would not be any potential construction-related impacts, therefore, no mitigation measures would be required.

4.5 SOCIOECONOMICS

4.5.1 Alternative 1: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains

Environmental Impacts

Implementation of Alternative 1 would not adversely affect socioeconomic resources within the region of influence including: population, employment or the local housing market.

Mitigation Measures

No mitigation measures would be required.

4.5.2 Alternative 2: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains plus Advanced Wastewater Treatment and Reclamation of a Portion of the Effluent (Preferred Alternative)

Environmental Impacts

Implementation of Alternative 2 would not adversely affect socioeconomic resources within the region of influence including: population, employment or the local housing market.

Mitigation Measures

No mitigation measures would be required.

4.5.3 Alternative 3: Tertiary Treated Effluent Blended with Secondary Effluent for Groundwater Recharge at Ysidora Flats

Environmental Impacts

Implementation of Alternative 3 would not adversely affect socioeconomic resources within the region of influence including: population, employment or the local housing market.

Mitigation Measures

No mitigation measures would be required.

4.5.4 Alternative 4: Advanced Wastewater Treatment and Discharge in Cased Wells at Lemon Grove

Environmental Impacts

Implementation of Alternative 4 would not adversely affect socioeconomic resources within the region of influence including: population, employment or the local housing market.

Mitigation Measures

No mitigation measures would be required.

4.5.5 Alternative 5: Advanced Wastewater Treatment with Irrigation of Agricultural Fields and Discharge in Cased Wells

Environmental Impacts

Implementation of Alternative 5 would not adversely affect socioeconomic resources within the region of influence including: population, employment or the local housing market.

Mitigation Measures

No mitigation measures would be required.

4.5.6 No Action Alternative

Environmental Impacts

With the No Action Alternative, there would not be any construction of vertical drains, AWT plants, cased wells, or discharge, as described in the proposed action alternatives. Therefore, there would not be any adverse effects on socioeconomic resources within the region of influence.

Mitigation Measures

With the No Action Alternative, there would not be any potential impacts, therefore, no mitigation measures would be required.

4.6 ENVIRONMENTAL JUSTICE/PROTECTION OF CHILDREN

4.6.1 Alternative 1: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains

Environmental Impacts

Implementation of Alternative 1 would not have any disproportionate effects on low-income or minority populations within the study area.

There are no populations of children in the study area that would suffer disproportionately from environmental health risks or safety risks during construction. The relatively low level of construction traffic and the materials carried by that traffic would not pose any disproportional environmental health risks or safety risks to children compared to baseline conditions. Operational impacts would not produce disproportionately high environmental health risks or safety risks to children who reside in the study area, for reasons similar to those stated for construction impacts.

Mitigation Measures

Incorporation of the construction BMPs discussed in Section 4.4 would minimize any potential health risk to nearby children.

4.6.2 Alternative 2: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains plus Advanced Wastewater Treatment and Reclamation of a Portion of the Effluent (Preferred Alternative)

Environmental Impacts

Implementation of Alternative 2 would not have any disproportionate effects on low-income or minority populations within the study area, nor would there be significant risks to children. Operation of advanced wastewater treatment facilities would include the use of chlorine gas for disinfection of effluent, as described in Section 4.4 2. Risks to children would be less than significant because of the existing security fencing.

Mitigation Measures

BMPs to minimize the potential health risks to children would be the same as discussed in Section 4.4.1. No further mitigation measures would be required.

4.6.3 Alternative 3: Tertiary Treated Effluent Blended with Secondary Effluent for Groundwater Recharge at Ysidora Flats

Environmental Impacts

Implementation of Alternative 3 would not have any disproportionate effects on low-income or minority populations within the study area, nor would there be significant risks to children. Operation of tertiary treatment facilities would include the use of chlorine gas for disinfection of effluent, as described in Section 4.4 2. Risks to children would be less than significant with the provision of security fencing.

Mitigation Measures

BMPs to minimize the potential health risks to children would be the same as in Section 4.4.1. Additional fencing would be provided as described in Section 4.4.3.

4.6.4 Alternative 4: Advanced Wastewater Treatment and Discharge in Cased Wells at Lemon Grove

Environmental Impacts

Implementation of Alternative 4 would not have any disproportionate effects on low-income or minority populations within the study area. The proposed equalization basins may be an "attractive nuisance" hazard for children. Permanent fencing would be installed to minimize risks to children.

Mitigation Measures

BMPs to minimize the potential health risks to children would be the same as discussed for Alternative 3.

4.6.5 Alternative 5: Advanced Wastewater Treatment with Irrigation of Agricultural Fields and Discharge in Cased Wells

Environmental Impacts

Implementation of Alternative 5 would not have any disproportionate effects on low-income or minority populations within the study area. As discussed in Alternative 4 (Section 4.6.4), there would be potential health and safety risks to children, from the proposed equalization basin and the use of chlorine gas. Also, Section 4.4 of this FSEIS discusses the potential hazard for consumption of reclaimed water in the agricultural fields. A portion of the fields are adjacent to the Stuart Mesa housing area, where many children live. Section 4.4 includes measures to minimize the risks to children, which would not be significant.

Mitigation Measures

BMPs and fencing and signage for the tertiary treatment facilities and equalization basin to minimize the potential health risks to children would be the same as discussed for Alternative 4.

4.13.6 No Action Alternative

Environmental Impacts

With the No Action Alternative, there would not be any construction of vertical drains, AWT plants, cased wells, or discharge systems as described in the proposed action alternatives. Therefore, there would not be any potential for disproportionate effects on low income and minority populations or children.

Mitigation Measures

With the No Action Alternative, there would not be any impacts, therefore, no mitigation measures would be required.

4.7 GEOLOGY AND SOILS

4.7.1 Alternative 1 Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains

Environmental Impacts

Implementation of Alternative 1 would require construction of up to 84 vertical drains within the Lemon Grove ponds. The general plans and specifications used for the work now under construction would be extended to the work required to implement Alternative 1. The potential impacts and mitigation measures for Alternative 1 would be similar to those described in the FEIS/R for project-related construction activities, and are summarized below:

Ground Acceleration and Ground Shaking

The project designs and specifications would incorporate measures from current seismic design codes in order to minimize the risk of damage from ground acceleration and ground shaking. Therefore, the potential impact would be less than significant.

Soils

Many of the soils in the project area have moderate-to-severe erodability characteristics, as shown in Table 3-8. Disturbance of these soils would result in potential impacts from erosion. Pursuant to the Clean Water Act as amended in 1987, the USEPA has implemented the NPDES Permitting Program. All construction projects that encompass five or more acres would require a NPDES General Storm Water Discharge Permit, for construction. In order to obtain project authorization under the NPDES storm water permit, a Notice of Intent (NOI) would be submitted to the USEPA at least 30 days prior to the commencement of construction. The NOI would certify that the construction would incorporate BMP for runoff control.

The scope of the proposed action would require that the contractor comply with NPDES General Permit No. CAS000002 *Waste Discharge Requirements for Discharge of Storm Water Runoff Associated with Construction Activity.* Compliance would include development and implementation of a storm water pollution prevention plan. Some of the erosion prevention measures would include mechanical retardation and control of runoff with diversion ditches, silt fences, and straw bales; use of temporary sediment basins; and provision of temporary slope protection measures such as netting, mulching, and hydroseeding.

With incorporation of BMP to prevent erosion during construction, and site restoration through proper grading and re-seeding after construction completion, there would not be any significant soil erosion impacts.

Liquefaction

Project design specifications would require that soils be compacted and tested to demonstrate compaction to at least 90 percent maximum density. Should poorly consolidated alluvium, which has a moderate to high liquefaction potential be present, this specification would reduce the potential for liquefaction impact to less than significant levels.

Paleontological Resources

Some project features may be underlain by sandstone and claystone sedimentary formations which possess a moderate to high paleontological resource sensitivity. Because portions of the project area are underlain by geologic materials that may have high paleontological resource sensitivity, there would be a potential for significant impact.

Mitigation Measures

To reduce significant impacts on paleontological resources to an acceptable level, the Marine Corps would initiate the following mitigation measures:

1. Areas with high paleontological resource sensitivity would be identified, and environmental monitors would be present when construction activities occur within designated sensitive areas.

2. Experienced environmental monitors would assure that environmental protection measures are maintained, and that paleontological resources are recovered and curated according to approved procedures.

4.7.2 Alternative 2: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains plus Advanced Wastewater Treatment and Reclamation of a Portion of the Effluent (Preferred Alternative)

Environmental Impacts

Implementation of Alternative 2 would include the construction described in Alternative 1 and additional construction at STP 2. Potential impacts for geology, soils, and paleontological resources for Alternative 2 would be the same as for Alternative 1.

Mitigation Measures

Mitigation measures to minimize potential geology, soils and paleontological impacts would be the same as discussed for Alternative 1.

4.7.3 Alternative 3: Tertiary Treated Effluent Blended with Secondary Effluent for Groundwater Recharge at Ysidora Flats

Environmental Impacts

Alternative 3 would include excavation and construction for the AWT and equalization basin at Lemon Grove, the pipeline from the AWT to Ysidora Flats, and the discharge system at Ysidora Flats. Potential impacts for geology, soils, and paleontological resources for Alternative 3 would be the same as for Alternative 1.

Mitigation Measures

Mitigation measures to minimize potential geology, soils and paleontological impacts would be the same as discussed for Alternative 1.

4.7.4 Alternative 4: Advanced Wastewater Treatment and Discharge in Cased Wells at Lemon Grove

Environmental Impacts

Alternative 4 would result in excavation and construction at the Lemon Grove ponds, AWT site and equalization basin. Potential impacts for geology, soils, and paleontological resources for Alternative 4 would be similar to impacts of Alternative 1.

Mitigation Measures

Mitigation measures to minimize potential geology, soils and paleontological impacts would be the same as discussed for Alternative 1.

4.7.5 Alternative 5: Advanced Wastewater Treatment with Irrigation of Agricultural Fields and Discharge in Cased Wells

Environmental Impacts

Implementation of Alternative 5 would require excavation and construction as described for Alternative 4, and for the pipeline from Lemon Grove to the agricultural irrigation reservoirs. Potential impacts for geology, soils, and paleontological resources for Alternative 5 would be the same as for Alternative 1.

Mitigation Measures

Mitigation measures to minimize potential geology, soils and paleontological impacts would be the same as discussed for Alternative 1.

4.7.6 No Action Alternative

Environmental Impacts

With the No Action Alternative, there would not be any construction of vertical drains, AWT plants, cased wells, or effluent discharge systems as described in the proposed action alternatives.

Mitigation Measures

With the No Action Alternative, there would not be any potential impacts, therefore, no mitigation measures would be required.

4.8 AIR QUALITY

The majority of emissions associated with each alternative would occur during construction. Heavy equipment used for grading and construction, and lighter vehicles used for crew commuting and other construction tasks would create exhaust emissions. Fugitive dust would be generated by grading, trench excavation, backfill, and travel on unpaved surfaces. Dust emissions associated with construction activities may vary substantially from day to day, depending on the level of activity, the specific operations being conducted, and the prevailing meteorological conditions. The quantity of fugitive dust generated would be proportional to the area of land disturbed, soil moisture content, and the level of construction activity.

Clean Air Act Conformity

Location in a Nonattainment Area. NAAQS have been established for ozone, CO, SO_2, NO_2, PM_{10}, and lead. Specific geographic areas are classified under the Federal Clean Air Act as either "attainment" or "nonattainment" for each pollutant, based on conformance with or violation of the NAAQS. The General Conformity Rule applies only to actions that generate emissions in nonattainment or maintenance areas. MCB Camp Pendleton is located within the SDAB, a "serious" nonattainment area for ozone and a maintenance area for CO. Therefore, the General Conformity Rule is applicable at the project location.

Emission of Criteria Pollutants. The General Conformity Rule requires analysis only of emissions of criteria pollutants and their precursors for which an area is designated to be in nonattainment or that are covered by a maintenance plan. Each alternative would include construction equipment and mobile sources which would emit CO, volatile organic compounds (VOC) and oxides of nitrogen (NO_x). VOC and NO_x are the precursors of ozone. Therefore, the General Conformity Rule is applicable to the project-related emissions of CO, VOC and NO_x.

Exemptions. USEPA has determined specific Federal actions, or portions thereof, to be exempt from the General Conformity Rule. Actions are exempt where the total of all reasonably foreseeable direct and indirect emissions does not equal or exceed prescribed threshold levels for a formal conformity determination, called "*de minimis*" levels. Other exempt actions include those which are presumed to conform, and include generally, actions that would result in no emission increase or an increase that is clearly *de minimis*; actions presumed to conform through separate analysis or rule-making actions; and emergency actions. Under 40 C. F. R. § 51.853(d)(4) and 40 C. F. R. § 93.153(d)(4), a conformity determination is not required for any of the alternatives presented in this FSEIS because the action under any one of the alternatives is specifically required to comply with existing environmental laws

and regulations. Nonetheless, a conformity applicability analysis was conducted for each alternative to determine the significance of air quality impacts generally, and inform the public as required by NEPA. In accordance with *Chief of Naval Operations Interim Guidance on Compliance with the Clean Air Act General Conformity Guidelines* (U.S. Navy 1994), a Record of Non-Applicability (RONA) has been prepared, and is included in Appendix C of this FSEIS.

NEPA Significance

A NEPA analysis differs from the General Conformity analysis in that attainment pollutant emissions are considered as well as nonattainment pollutants. Therefore, emissions of PM_{10} and SO_2, which are not considered in the General Conformity analysis, are included in the NEPA analysis. The *de minimis* thresholds used to evaluate the proposed action for general conformity are appropriate for the determination of a significant impact under NEPA. This evaluation does not address lead, hydrogen sulfide, or vinyl chloride. Although these pollutants are regulated by the federal or state governments, little to no emissions of these substances would be generated during construction or operation of the proposed Alternatives.

Emissions Calculations

Construction emissions have been evaluated using emission factors and methods published in the South Coast Air Quality Management District (SCAQMD) California Environmental Quality Act (CEQA) Handbook (1993), which are based upon emissions factors published by the USEPA in *Compilation of Air Pollution Emission Factors, AP-42.*

4.8.1 Alternative 1: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains

Environmental Impacts

Implementation of Alternative 1 would require construction of up to 84 vertical drains within the Lemon Grove ponds. Table 4-3 compares the estimated construction emissions with the General Conformity thresholds. As shown in the table, emissions of CO, VOC and NO_x would be below the thresholds. Therefore, Alternative 1 emissions would be less than the *de minimis* thresholds, and would conform with the SIP.

Table 4-3
Estimated Construction Emissions
Alternative 1

	Pollutant Emissions - Tons per Year				
	CO	VOC	NO_x	SO_2	PM_{10}
Total Construction Emissions - Tons	**0.2**	**<0.1**	**0.2**	**<0.1**	**0.5**
General Conformity *de minimis* Thresholds - Tons per year[1]	100	50	50	100	100
Exceed threshold?	No	No	No	No	No

[1] De minimis thresholds for San Diego Air Basin nonattainment pollutants CO, VOC and NO_X. The basin is in federal attainment for SO_2 and PM_{10}; *de minimis* thresholds for SO_2 and PM_{10} nonattainment are used for NEPA significance determinations.

Emissions of SO_2 and PM_{10} would also be below the thresholds. Therefore, there would not be any significant air quality impact from the construction of Alternative 1. Pollutant emissions following construction would be limited to the emissions from vehicles used by maintenance personnel. The emissions would be less than significant.

Mitigation Measures

There would not be any significant impacts, therefore, no mitigation measures would be required.

4.8.2 Alternative 2: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains plus Advanced Wastewater Treatment and Reclamation of a Portion of the Effluent (Preferred Alternative)

Environmental Impacts

Air quality impacts associated with Alternative 2 would be similar to, but greater than, those of Alternative 1. A wastewater treatment plant would be constructed at STP 2. Table 4-4 compares the estimated construction emissions with the General Conformity thresholds. As shown in the table, emissions of CO, VOC and NO_x would be below the thresholds. Therefore, Alternative 2 emissions would be less than the *de minimis* thresholds, and would conform with the SIP.

Table 4-4
Estimated Construction Emissions
Alternative 2

	Pollutant Emissions - Tons per Year				
	CO	VOC	NO_x	SO_2	PM_{10}
Phase 1 emissions = Alternative 1 emissions	0.2	<0.1	0.2	<0.1	0.5
Phase 2 emissions	1.1	0.3	4.9	<0.1	0.4
Total Construction Emissions - Tons	**1.3**	**0.4**	**5.1**	**<0.1**	**0.9**
General Conformity *de minimis* Thresholds - Tons per year[1]	100	50	50	100	100
Exceed threshold?	No	No	No	No	No

[1] De minimis thresholds for San Diego Air Basin nonattainment pollutants CO, VOC and NO_X. The basin is in federal attainment for SO_2 and PM_{10}; *de minimis* thresholds for SO_2 and PM_{10} nonattainment are used for NEPA significance determinations.

Emissions of SO_2 and PM_{10} would also be below the thresholds. Therefore, there would not be any significant air quality impact from the construction of Alternative 2. Pollutant emissions following construction would be limited to the emissions from vehicles used by maintenance personnel. The emissions would be less than significant.

Mitigation Measures

There would not be any significant impact, therefore, no mitigation measures would be required.

4.8.3 Alternative 3: Tertiary Treated Effluent Blended with Secondary Effluent for Groundwater Recharge at Ysidora Flats

Environmental Impacts

Implementation of Alternative 3 would require construction of an AWT plant at STP 13, approximately 13,000 feet of pipeline, and effluent distribution facilities at Ysidora Flats. Table 4-5 compares the estimated construction emissions with the General Conformity thresholds. As shown in the table, emissions of CO, VOC and NO_x would be below the thresholds. Therefore, Alternative 3 emissions would be less than the *de minimis* thresholds, and would conform with the SIP.

Table 4-5
Estimated Construction Emissions
Alternative 3

	Pollutant Emissions - Tons per Year				
	CO	VOC	NO_x	SO_2	PM_{10}
Total Construction Emissions - Tons	**2.5**	**0.7**	**9.9**	**<0.1**	**1.2**
General Conformity *de minimis* Thresholds - Tons per year[1]	100	50	50	100	100
Exceed threshold?	No	No	No	No	No

[1] De minimis thresholds for San Diego Air Basin nonattainment pollutants CO, VOC and NO_X. The basin is in federal attainment for SO_2 and PM_{10}; *de minimis* thresholds for SO_2 and PM_{10} nonattainment are used for NEPA significance determinations.

Emissions of SO_2 and PM_{10} would also be below the thresholds. Therefore, there would not be any significant air quality impact from the construction of Alternative 3. Pollutant emissions following construction would be limited to the emissions from vehicles used by maintenance personnel. The emissions would be less than significant.

Mitigation Measures

There would not be any significant impacts, therefore, no mitigation measures would be required.

4.8.4 Alternative 4: Advanced Wastewater Treatment and Discharge in Cased Wells at Lemon Grove

Environmental Impacts

Implementation of Alternative 4 would require construction of an equalization basin, an AWT plant at STP 13, (less complex than the AWT for Alternative 3), and approximately 11 cased, gravity injection wells adjacent to the Lemon Grove ponds. Table 4-6 compares the estimated construction emissions with the General Conformity thresholds. As shown in the table, emissions of CO, VOC and NO_x would be below the thresholds. Therefore, Alternative 4 emissions would be less than the *de minimis* thresholds, and would conform with the SIP.

Table 4-6
Estimated Construction Emissions
Alternative 4

	Pollutant Emissions - Tons per Year				
	CO	VOC	NO_X	SO_2	PM_{10}
Total Construction Emissions - Tons	**2.5**	**0.7**	**9.9**	**<0.1**	**1.1**
General Conformity *de minimis* Thresholds - Tons per year[1]	100	50	50	100	100
Exceed threshold?	No	No	No	No	No

[1] De minimis thresholds for San Diego Air Basin nonattainment pollutants CO, VOC and NO_X. The basin is in federal attainment for SO_2 and PM_{10}; *de minimis* thresholds for SO_2 and PM_{10} nonattainment are used for NEPA significance determinations.

Emissions of SO_2 and PM_{10} would also be below the thresholds. Therefore, there would not be any significant air quality impact from the construction of Alternative 4. Pollutant emissions following construction would be limited to the emissions from vehicles used by maintenance personnel. The emissions would be less than significant.

Mitigation Measures

There would not be any significant impacts, therefore, no mitigation measures would be required.

4.8.5 Alternative 5: Advanced Wastewater Treatment with Irrigation of Agricultural Fields and Discharge in Cased Wells

Environmental Impacts

Air quality impacts associated with Alternative 5 would be similar to, but greater than, those of Alternative 4. In addition to the AWT plant and cased wells at Lemon Grove, a pipeline of approximately 7,000 feet in length would be constructed between the AWT and the existing irrigation reservoirs. Table 4-7 compares the estimated construction emissions with the General Conformity thresholds. As shown in the table, emissions of CO, VOC and NO_x would be below the thresholds. Therefore, Alternative 5 emissions would be less than the *de minimis* thresholds, and would conform with the SIP.

Table 4-7
Estimated Construction Emissions
Alternative 5

	Pollutant Emissions - Tons per Year				
	CO	VOC	NO_X	SO_2	PM_{10}
Alternative 4 emissions	2.5	.7	9.9	<0.1	1.1
Pipeline construction emissions	0.2	<0.1	0.1	<0.1	0.1
Total Construction Emissions - Tons	**2.7**	**0.7**	**10**	**<0.1**	**1.2**
General Conformity *de minimis* Thresholds - Tons per year[1]	100	50	50	100	100
Exceed threshold?	No	No	No	No	No

[1] De minimis thresholds for San Diego Air Basin nonattainment pollutants CO, VOC and NO_X. The basin is in federal attainment for SO_2 and PM_{10}; *de minimis* thresholds for SO_2 and PM_{10} nonattainment are used for NEPA significance determinations.

Emissions of SO_2 and PM_{10} would also be below the thresholds. Therefore, there would not be any significant air quality impact from the construction of Alternative 5. Pollutant emissions following construction would be limited to the emissions from vehicles used by maintenance personnel. The emissions would be less than significant.

Mitigation Measures

There would not be any significant impacts, therefore, no mitigation measures would be required.

4.8.6 No Action Alternative

Environmental Impacts

With the No Action Alternative, there would not be any construction of vertical drains, AWT plants, cased wells, or systems as described in the proposed action alternatives. Therefore, there would not be any potential air quality impacts.

Mitigation Measures

With the No Action Alternative, there would not be any potential impacts, therefore, no mitigation measures would be required.

4.9 LAND USE

Potential land use impacts pertaining to the alternatives are focused on compatibility with existing land uses, consistency with adopted plans at MCB Camp Pendleton and with the California Coastal Act, and avoidance of known land use restrictions associated with the performance of MCB Camp Pendleton mission operations.

4.9.1 Alternative 1: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains

Environmental Impacts

Lemon Grove

Impacts associated with the construction and operation of the Lemon Grove percolation ponds were addressed in the FEIS/R. Implementation of this alternative would not displace any existing land uses, and would not disrupt military maneuvers since the area is not used for any such activities. The Lemon Grove ponds with cased vertical drains would be compatible with STP 13 and the recycling facility on the north and east, and the transportation corridor on the west. No land uses such as residences, schools, or hospitals are located near the site, therefore, no significant land use incompatibility impacts are associated with the site.

California Coastal Act

Sewage effluent is presently discharged from STPs 1, 2, 3, 8, and 13 into the Santa Margarita River and flood plain which creates water quality impacts that reaches the coastal zone, including the estuary, beach and ocean environments. Alternative 1 would correct this discharge and afford protection to coastal zone resources. All improvements would be constructed within MCB Camp Pendleton, thus no public access or recreational opportunities in the coastal zone would be impacted.

Mitigation Measures

Alternative 1 would not result in any land use impacts; no mitigation is required.

4.9.2 Alternative 2: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains plus Advanced Wastewater Treatment and Reclamation of a Portion of the Effluent (Preferred Alternative)

Environmental Impacts

Potential land use impacts at Lemon Grove for Alternative 2 would be similar to those of Alternative 1. Construction of an advanced wastewater treatment plant at the STP 2 site and construction of the distribution pipeline would not result in additional land use impacts or coastal zone impacts.

Mitigation Measures

Alternative 2 would not result in any land use impacts, therefore, no mitigation measures would be required.

4.9.3 Alternative 3: Tertiary Treated Effluent Blended with Secondary Effluent for Groundwater Recharge at Ysidora Flats

Environmental Impacts

Potential land use impacts at Lemon Grove for Alternative 3 would be similar to those of Alternative 1. Construction of the AWT plant would not displace existing land uses on site, and would not disrupt military maneuvers, as the site is not currently used for any such activities. The AWT plant would be compatible with STP 13, a similar land use, and the adjacent open space and transportation uses. Construction of the distribution pipeline would not result in land use impacts. The area proposed for discharge in Ysidora Flats is currently a biological mitigation area. Careful water quality and biological resource monitoring proposed in Sections 4.1 and 4.3 would assure that this use is preserved.

Mitigation Measures

Alternative 3 would not result in any land use impacts, therefore, no mitigation measures would be required.

4.9.4 Alternative 4: Advanced Wastewater Treatment and Discharge in Cased Wells at Lemon Grove

Potential land use impact at Lemon Grove would be similar to those of Alternative 1. Construction of the AWT would not result in land use impacts as described in Alternative 3.

Mitigation Measures

Alternative 4 would not result in any land use impacts, therefore, no mitigation measures would be required.

4.9.5 Alternative 5: Advanced Wastewater Treatment with Irrigation of Agricultural Fields and Discharge in Cased Wells at Lemon Grove

Environmental Impacts

Potential land use impacts at Lemon Grove, the AWT plant site and the pipelines would be the same as described for Alternatives 1 and 3. No land use impacts would result as a result of agricultural field irrigation.

Mitigation Measures

Alternative 5 would not result in any land use impacts, therefore, no mitigation would be required.

4.9.6 No Action Alternative

Environmental Impacts

With the No Action Alternative, there would not be any construction of vertical drains, AWT plants, cased wells, or discharge systems as described in the proposed action alternatives. Therefore, there would not be any potential land use impacts.

Mitigation Measures

With the No Action Alternative, there would not be any potential land use impacts, therefore, no mitigation measures would be required.

4.10 NOISE

4.10.1 Alternative 1: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains

Environmental Impacts

A discussion of noise levels for various construction activities is included in the FEIS/R. Under Alternative 1, construction noise would result from drilling of the vertical drains. Trucks would be required to deliver sand and equipment necessary to add vertical drains at the ponds. Approximately two to four round trips per day would be required. Construction noise levels combined with truck noise would be less than 75 dB Leq at the nearest sensitive human receptors. There would not be any significant noise impact to human receptors from installation of the vertical drains at the percolation ponds.

There is noise-sensitive wildlife near the Lemon Grove pond site. Impact to these species would be avoided by scheduling construction during the non-breeding seasons. The impacts of Alternative 1 construction on noise-sensitive wildlife, and associated mitigation measures, are discussed in detail in Section 4.3.

Mitigation Measures

There would not be any significant noise impact to humans; thus, no mitigation measures would be required. Mitigation measures for potential noise impacts to sensitive wildlife are addressed in Section 4.3 of this FSEIS.

4.10.2 Alternative 2: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains plus Advanced Wastewater Treatment and Reclamation of a Portion of the Effluent (Preferred Alternative)

Environmental Impacts

Noise impacts associated with Alternative 2 would be similar to Alternative 1 with the addition of construction noise related to construction of an advanced wastewater treatment plant at STP 2. No human receptors would be significantly impacted at STP 2 since the closest noise receptor is 1,200 feet from STP 2. Indirect impacts to noise sensitive wildlife would be similar to Alternative 1 with

the addition of potential noise impacts to sensitive wildlife near the pipe installation site at STP 2 and Pilgrim Creek.

Mitigation Measures

Mitigation measures would be similar to Alternative 1 with the addition of mitigation measure for potential noise impacts to sensitive wildlife near STP 2 and Pilgrim Creek as required in Section 4.3.

4.10.3 Alternative 3: Tertiary Treated Effluent Blended with Secondary Effluent for Groundwater Recharge at Ysidora Flats

Environmental Impacts

Noise impacts at Lemon Grove would be similar to Alternative 1 with the addition of construction noise related to construction of an advanced wastewater treatment plant at STP 13 and a discharge delivery pipeline at the Ysidora Flats area. No human receptors would be significantly impacted at Ysidora Flats since no receptors are located in the vicinity. Indirect impacts to noise sensitive wildlife would be similar to Alternative 1 with the addition of potential noise impacts to sensitive wildlife near the Ysidora Flats discharge pipeline construction corridor. The proposed AWT would generate noise levels less than 60 dB at 100 feet and would not impact human receptors or noise sensitive wildlife species.

Mitigation Measures

Mitigation measures for Alternative 3 would be similar to mitigation measures for Alternatives 1 and 2.

4.10.4 Alternative 4: Advanced Wastewater Treatment and Discharge in Cased Wells at Lemon Grove

Environmental Impacts

Noise impacts at the Lemon grove site associated with Alternative 4, would be similar to impacts of Alternative 1, with the addition of impacts associated with the construction of an AWT plant near STP 13. The AWT would generate noise levels less than 60 dB at 100 feet and would not impact human receptors or noise sensitive wildlife species.

Mitigation Measures

Mitigation measures for Alternative 4 would be similar to mitigation measures for Alternative 1.

4.10.5 Alternative 5: Advanced Wastewater Treatment with Irrigation of Agricultural Fields and Discharge in Cased Wells

Environmental Impacts

Noise impacts of Alternative 4 would be similar to noise impacts of Alternative 1.

Mitigation Measures

Mitigation measures for Alternative 4 would be the same as for Alternative 1.

4.10.6 No Action Alternative

Environmental Impacts

With the No Action Alternative, there would not be any construction of vertical drains, AWT plants, cased wells, or discharge systems as described in the proposed action alternatives. Therefore, there would not be any potential noise impacts not previously discussed in the FEIS/R.

Mitigation Measures

With the No Action Alternative, there would not be any potential impacts, therefore, no mitigation measures would be required.

4.11 TRANSPORTATION AND VEHICULAR CIRCULATION

4.11.1 Alternative 1: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains

Environmental Impacts

Environmental impacts relative to transportation and circulation would occur during the construction of the facilities required for Alternative 1. Traffic during construction would result from truck traffic removing excavated material from the vertical drains, from construction material delivery, and from occasional light vehicles used by maintenance personnel. This would not cause any long-term impacts on roadway capacity, level of service, or roadway condition.

A discussion of traffic generation and traffic control measures for the original proposed action and alternatives is included in the FEIS/R. Impacts would be limited to traffic disturbances resulting from the construction of pipelines in roadways. The FEIS/R and the project specifications required a traffic control plan for use in maintaining access for vehicles and pedestrians. Use of this plan would reduce potential traffic impacts to a less than significant level.

Mitigation Measures

No mitigation measures, other than the traffic control plan described in the FEIS/R, would be required.

4.11.2 Alternative 2: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains plus Advanced Wastewater Treatment and Reclamation of a Portion of the Effluent (Preferred Alternative)

Environmental Impacts

Potential traffic impacts would be limited to traffic disturbances resulting from the construction of pipelines in roadways and construction of the valve adjacent to Vandegrift Boulevard. The FEIS/R and the project specifications required a traffic control plan for use in maintaining access for vehicles and pedestrians. Use of this plan would reduce potential traffic impacts to a less than significant level.

Mitigation Measures

No mitigation measures, other than the traffic control plan described in the FEIS/R, would be required.

4.11.3 Alternative 3: Tertiary Treated Effluent Blended with Secondary Effluent for Groundwater Recharge at Ysidora Flats

Environmental Impacts

Environmental impacts relative to transportation and circulation would occur during the construction of the facilities required for Alternative 3. Traffic during construction would result from truck traffic removing excavated material from the vertical drains, from construction of the pipeline adjacent to Vandegrift Boulevard, from construction material delivery, and from occasional light vehicles used by maintenance personnel. This would not cause any long-term impacts on roadway capacity, level of service, or roadway condition.

A discussion of traffic generation and traffic control measures for the original proposed action and alternatives is included in the FEIS/R. Impacts would be limited to traffic disturbances resulting from the construction of pipelines in roadways. The FEIS/R and the project specifications required a traffic control plan for use in maintaining access for vehicles and pedestrians. Use of this plan would reduce potential traffic impacts to a less than significant level.

Mitigation Measures

No mitigation measures, other than the traffic control plan described in the FEIS/R, would be required.

4.11.4 Alternative 4: Advanced Wastewater Treatment and Discharge in Cased Wells at Lemon Grove

Environmental Impacts

Potential traffic impacts would be the same as those discussed under Alternative 1.

Mitigation Measures

Mitigation measures would be the same as those discussed under Alternative 1.

4.11.5 Alternative 5: Advanced Wastewater Treatment with Irrigation of Agricultural Fields and Discharge in Cased Wells

Environmental Impacts

Potential traffic impacts would be the same as those discussed under Alternative 1.

Mitigation Measures

Mitigation measures would be the same as those discussed under Alternative 1.

4.11.6 No Action Alternative

Environmental Impacts

With the No Action Alternative, there would not be any construction of vertical drains, AWT plants, cased wells, or discharge systems as described in the proposed action alternatives. Therefore, there would not be any potential traffic impacts.

Mitigation Measures

With the No Action Alternative, there would not be any potential impacts, therefore, no mitigation measures would be required.

4.12 VISUAL RESOURCES

4.12.1 Alternative 1: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains

Environmental Impacts

Implementation of this alternative would not result in significant visual impacts. Effluent would be conveyed to the ponds at Lemon Grove in the system now being constructed. The FEIS/R identified short-term and long-term visual disturbances to the natural terrain of the Lemon Grove area, although neither impact was considered to be significant. The principal views of the Lemon Grove area would be from I-5, and, because of the speed of traffic, the views would be very brief. Construction of the cased vertical drains would not result in additional visual impacts.

Mitigation Measures

There would not be any significant visual impacts associated with Alternative 1, and no mitigation measures would be required.

4.12.2 Alternative 2: Discharge of Secondary Effluent at Lemon Grove in Ponds with Vertical Drains plus Advanced Wastewater Treatment and Reclamation of a Portion of the Effluent (Preferred Alternative)

Environmental Impacts

Implementation of this alternative would not result in significant visual impacts. Construction of the advanced wastewater treatment plant proposed as part of this alternative would not result in significant visual impacts. The advanced wastewater plant would be constructed adjacent to STP 2 and would blend with the existing facilities.

Mitigation Measures

There would not be any significant visual impacts associated with Alternative 2, and no mitigation measures would be required.

4.12.3 Alternative 3: Tertiary Treated Effluent Blended with Secondary Effluent for Groundwater Recharge at Ysidora Flats

Environmental Impacts

Implementation of this alternative would not result in significant visual impacts. The proposed AWT plant would have a visual character that would be similar to the existing adjacent STP. The change of views would be minor, and would not be significant. The Ysidora Flats outfall area is screened from viewers traveling on Vandegrift Boulevard by intervening vegetation.

Mitigation Measures

There would not be any significant visual impacts associated with Alternative 3, and no mitigation measures would be required.

4.12.4 Alternative 4: Advanced Wastewater Treatment and Discharge in Cased Wells at Lemon Grove

Environmental Impacts

Implementation of this alternative would not result in significant visual impacts. The proposed AWT plant, equalization basin and cased wells would have visual character that would be similar to the existing adjacent STP.

Mitigation Measures

There would not be any significant visual impacts associated with Alternative 4, and no mitigation measures would be required.

4.12.5 Alternative 5: Advanced Wastewater Treatment with Irrigation of Agricultural Fields and Discharge in Cased Wells

Environmental Impacts

Visual impacts for the implementation of Alternative 5 would be similar to those described in Alternative 4. There would not be any visual impacts at the agricultural fields.

Mitigation Measures

There would not be any significant visual impacts associated with Alternative 5, and no mitigation measures would be required.

4.12.6 No Action Alternative

With the No Action Alternative, there would not be any construction of vertical drains, AWT plants, cased wells, or discharge systems as described in the proposed action alternatives. Therefore, there would not be any potential visual resource impacts.

Mitigation Measures

With the No Action Alternative, there would not be any visual impacts, therefore, no mitigation measures would be required.

4.13 UTILITIES

4.13.1 Alternative 1: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains

Environmental Impacts

The construction and operation of Alternative 1 would require little or no use of natural gas, central heating systems, solid and hazardous waste collection and disposal, or potable water. Some nonpotable water would be required for soil compaction, dust control or hydrotesting. The nonpotable water would be provided by contractor or MCB Camp Pendleton water trucks. There would be no significant impact on natural gas, central heating systems, solid and hazardous waste collection and disposal, or potable water utility systems.

Construction of the cased vertical drains would not require significant electrical energy. Operation of Alternative 1 would require less electrical energy than was analyzed in the FEIS/R, where the pumping of effluent to Oceanside was proposed. The FEIS/R concluded that operation of that proposed action would not result in a significant impact to electrical utilities. Therefore, the construction and operation of the cased vertical drain system would not result in a significant impact to electrical utilities.

Mitigation Measures

There would not be any significant utility impacts. Therefore, no mitigation measures would be required.

4.13.2 Alternative 2: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains plus Advanced Wastewater Treatment and Reclamation of a Portion of the Effluent (Preferred Alternative)

Environmental Impacts

The construction and operation of Alternative 2 would require little or no use of natural gas, central heating systems, solid and hazardous waste collection and disposal, or potable water. Some nonpotable water would be required for soil compaction, dust control or hydrotesting. The nonpotable water would be provided by contractor or MCB Camp Pendleton water trucks. There

would be no significant impact on natural gas, central heating systems, solid and hazardous waste collection and disposal, or potable water utility systems.

Construction and operation of the cased vertical drains, Phase 1 of Alternative 2, would be similar to Alternative 1, with no significant impact to electrical utilities. Operation of Alternative 2 would require electrical energy for the AWT facility, and would not result in a significant impact to electrical utilities.

Mitigation Measures

There would not be any significant utility impacts. Therefore, no mitigation measures would be required.

4.13.3 Alternative 3: Tertiary Treated Effluent Blended with Secondary Effluent for Groundwater Recharge at Ysidora Flats

Environmental Impacts

Alternative 3 would require electrical energy for the operation of the tertiary treatment plant and the pumps to convey STP 13 effluent to the Ysidora Flats discharge system. Utility impacts for Alternative 3 would be similar to those for Alternative 2. There would be no significant impacts.

Mitigation Measures

There would not be any significant utility impacts. Therefore, no mitigation measures would be required.

4.13.4 Alternative 4: Advanced Wastewater Treatment and Discharge in Cased Wells at Lemon Grove

Environmental Impacts

Alternative 4 would require electrical energy for the operation of the tertiary treatment plant and the pumps to convey the AWT effluent to the cased wells discharge system. Utility impacts for Alternative 4 would be similar to those for Alternative 2. There would be no significant impacts.

Mitigation Measures

There would not be any significant utility impacts. Therefore, no mitigation measures would be required.

4.13.5 Alternative 5: Advanced Wastewater Treatment with Irrigation of Agricultural Fields and Discharge in Cased Wells

Environmental Impacts

Alternative 5 would require electrical energy for the operation of the tertiary treatment plant and the pumps to convey AWT effluent to the irrigation storage ponds or to the cased well discharge system. Utility impacts for Alternative 3 would be similar to those for Alternative 2. There would be no significant impacts.

Mitigation Measures

There would not be any significant utility impacts. Therefore, no mitigation measures would be required.

4.13.6 No Action Alternative

Environmental Impacts

With the No Action Alternative, there would not be any construction of vertical drains, AWT plants, cased wells, or discharge systems as described in the proposed action alternatives. Therefore, there would not be any impacts to public utilities at MCB Camp Pendleton.

Mitigation Measures

With the No Action Alternative, there would not be any potential impacts, therefore, no mitigation measures would be required.

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CHAPTER 5.0
CUMULATIVE IMPACTS

5.0 CUMULATIVE IMPACTS

NEPA requires an analysis of the incremental effects of a proposed action that could result in cumulatively significant impacts when viewed in connection with other closely related past, present, and reasonably foreseeable future projects. Of particular concern is the contribution of the proposed effluent disposal action to overall cumulative impacts of other projects in the area. Section 5.1 addresses several proposed and planned actions at MCB Camp Pendleton and identifies the cumulative setting in which the proposed effluent disposal action would be developed. The other projects are neither dependent on the proposed effluent disposal action nor part of it. Analysis of the environmental impacts of the other projects has been or will be conducted separately, with the results of those analyses incorporated into environmental documents prepared specifically for those projects. The planned actions listed in this section are expected to be completed within the next five years.

5.1 OTHER PLANNED ACTIONS

The following on-going or reasonably foreseeable actions are included in this cumulative impacts analysis:

- Santa Margarita River Flood Control (P-010)
- Basilone Bridge Replacement (P-030)
- Santa Margarita River Water Wells Project (P-659)
- Base Realignment and Closure to MCAS/MCB Camp Pendleton
- Parking Apron Expansion (P-049)
- Transportation Infrastructure (P-347)
- Runway Overrun (P-562)
- Highbay Warehouse Phase II (P-050)
- Ultimate Clear Zone (Project PA303M)
- Convert Short Approach Landing System to Airfield Lighting Sequence Flashing System (Project PA403R)
- Communications/Electrical Infrastructure (P-004)
- Western Wire Mountain Family Housing
- DeLuz Family Housing
- San Mateo Point Family Housing
- Northern Power Distribution System (P-046)
- Santa Rosa Water Reclamation Facility 2 MGD Discharge to Murrieta Creek

- San Onofre Area (P-527A) and San Mateo/Las Pulgas (P-529) Sewage Effluent Compliance Projects
- Installation Restoration (IR) Program
- Ysidora Flats Effluent Outfall/Groundwater Recharge Program

A brief project description for each of these projects is given below. Figure 5-1 depicts the cumulative projects at MCB Camp Pendleton. To review a complete listing of all programmed projects on-Base, please refer to the MCB Camp Pendleton Master Plan (1992).

Santa Margarita River Flood Control Project (P-010)

This project involves the construction of a levee and floodwall, storm water management system, sediment control structures, and storm water pump stations for protection of MCAS Camp Pendleton, the Santa Margarita Ranch House complex, STP 3, and the 22 Area warehouse facilities from a 100-year flood event. This project should alleviate potential future impacts to MCAS Camp Pendleton and the 22 and 24 Area facilities due to flooding. The USACOE was a joint lead agency on the project, and the USFWS and the RWQCB served as cooperating agencies for the project's EIS. Extensive efforts by the Base with the cooperating agencies, along with the USEPA resulted in identifying the least environmentally damaging practicable alternative for flood management. Potential impacts are anticipated in the areas of air quality (during construction), hydrology (ground and surface water, supply and quality), biological resources, cultural resources, and visual resources. Construction equipment exhaust and fugitive dust emissions are anticipated to have a temporary impact on local air quality. This project was included in the USFWS' *Biological Opinion for Programmatic Activities and Conservation Plans in Riparian/Beach Ecosystems on MCB Camp Pendleton* (USFWS 1995). Although the Programmatic Biological Opinion (BO) issued by the USFWS in 1995 anticipated up to 32 acres of riparian habitat to be permanently lost and an additional 10 acres to be temporarily impacted, the final design for this project resulted in a permanent loss of approximately 11 acres and a temporary loss of approximately 20 acres. The Final EIS for this proposed action was submitted in November 1997 and the ROD was signed February 6, 1998. Construction of this project is ongoing.

Basilone Bridge Replacement (P-030)

This project would replace the temporary bridge constructed after the January 1993 flood with a permanent new bridge designed to withstand a 100-year flood event. This project was evaluated in conjunction with the Santa Margarita Flood Control Project (P-010) in a single EIS which was completed in November 1997. The ROD for these projects was issued in February 1998. Potential

impacts are anticipated in the areas of air quality and transportation during construction, along with hydrology (surface water flow), biological resources, and cultural resources over the long term. As indicated in the Programmatic BO issued by the USFWS in 1995, approximately 0.1 acre of permanent impacts and 3 acres of temporary impacts on riparian habitat are anticipated. Cultural resource impacts were addressed as part of NHPA Section 106 consultation and resulted in a Memorandum of Agreement among the Marine Corps, State Historic Preservation Officer, the Advisory Council of Historic Preservation, and Native American tribal organizations. Construction of the project is anticipated in 1999.

Santa Margarita River Water Wells Project (P-659)

This project involved the construction of four new water production wells in the lower Santa Margarita River basin (Figure 5-1). MCB Camp Pendleton obtains all potable water used on the installation from wells located within four groundwater basins. During 1993, severe flooding inundated and/or damaged some of the wells constructed without sanitary seals in the lower Santa Margarita River basin. When these wells were inundated, flood conditions resulted in entrainment of surface water resulting in bacteriological contamination of well water. Additionally, some of the existing wells succumbed to mechanical failure due to age.

An environmental assessment (EA) was completed and the Finding of No Significant Impact (FONSI) signed in December 1996. Construction of the new water production wells occurred in 1998. The wells combined produce from 3,500 to 5,000 gpm of potable water for MCB Camp Pendleton. The new water wells replace water wells damaged during the 1993 floods and increase the reliability of the water well system. The typical well design consists of a steel well casing, a 125-horsepower submersible pump, piping, and electrical control equipment located on a steel platform. The construction of four water wells resulted in the removal of 3.19 acres of habitat (3.04 acres of grass forb and 0.15 acres of mixed willow exotic). In accordance with the criteria provided in the BO, in which this action was included, the impacts to biological resources require mitigation through the implementation of an invasive exotic vegetation control program for 5.49 acres.

Base Realignment and Closure

The BRAC actions are realigning military assets from the MCAS Tustin and MCAS EL Toro to MCAS Camp Pendleton. This action would involve the relocation of selected personnel, aircraft, and equipment, and construction of new facilities to accommodate the realigned assets. The proposed action, described in Alternative B in the Final EIS (March 1996), would include construction of new facilities within the air station to accommodate an additional 52 rotary-wing

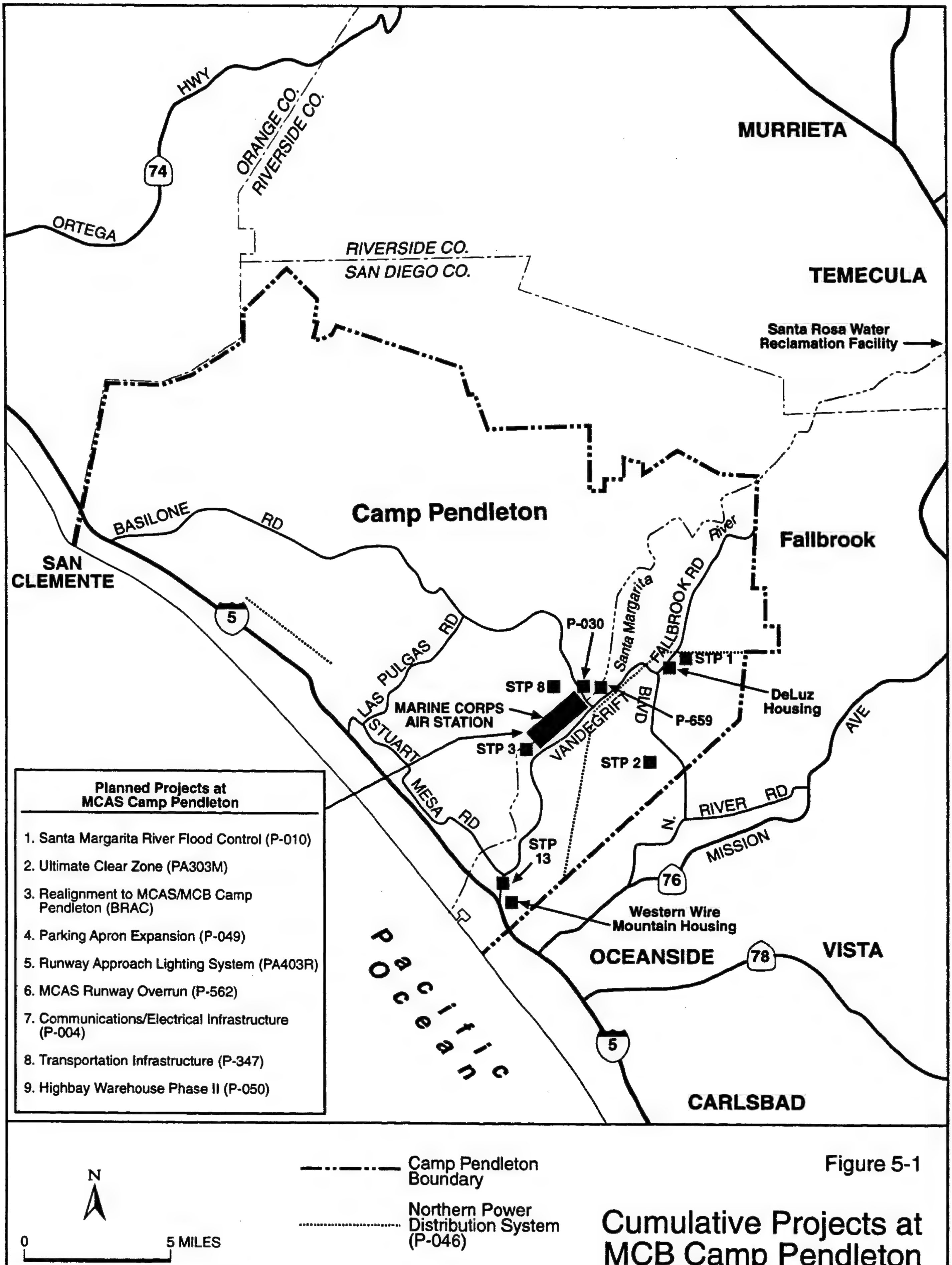

Figure 5-1

Cumulative Projects at MCB Camp Pendleton

aircraft and 800 personnel for a total of 185 aircraft and 3,900 personnel at MCAS Camp Pendleton. These would include facilities for refueling and fuel storage, training and administrative functions, warehousing and special storage, and aircraft and airfield maintenance. The additional personnel would also require construction of new Bachelor Enlisted Quarters in Chappo (24) Area, including dormitories, fitness facilities, and associated utility systems and parking. Construction of facilities associated with the proposed action would be accomplished through six BRAC projects which began in February, 1997 and are anticipated to be completed in 1999. Aircraft and personnel are projected to begin arriving in the same time frame as the new facilities are completed. The ROD for the EIS was signed in January, 1997.

The BRAC project would result in direct loss of 11.77 acres of riparian habitat currently used by least Bell's vireo (portions of nine 1994 territories) for nesting and foraging (3.84 acres of riparian woodland, 4.35 acres of riparian scrub, and 3.58 acres of mixed willow exotic habitat). An additional 15.02 acres of riparian habitats would be indirectly affected by the implementation of the project due to construction activities (6.56 acres of riparian woodland, 3.16 acres of riparian scrub, 5.30 acres of mixed willow exotic). These direct and indirect impacts would be significant. This level of impact is categorized as a Category II Activity by the recent USFWS Programmatic BO for riparian habitats on MCB Camp Pendleton.

Parking Apron Expansion Project (P-049)

This project would construct additional aircraft parking apron adjacent to the aircraft parking apron constructed under the BRAC projects. Construction of this project is projected for 1998. Due to the disturbed conditions of the construction area, potential impacts are limited to air quality and aircraft operations during construction, and hydrology (surface water quality). This action was categorically excluded from NEPA analysis.

Transportation Infrastructure (P-347)

This project involves the construction of an additional Troop Staging Area and roads and parking lots on the air station to create a logical, safe, and efficient layout of the local transportation system. This project corrects long-standing deficiencies. Due to the disturbed condition of the construction area, potential impacts are limited to air quality during construction, hydrology (surface water only), and transportation (beneficial). A categorical exclusion has been completed for this project and construction was completed in December 1997.

Runway Overrun (P-562)

This project would construct a paved area at the end of the MCAS Camp Pendleton runway to comply with Federal Aviation Administration safety regulations. The project would protect aircraft from damage in an aviation mishap event. The proposed action would involve the construction of a 1,000-foot-long by 200-foot-wide paved runway overrun area extending from and attached to the south end of the existing 6,000-foot-long runway. The proposed action would include asphaltic concrete paving, drainage improvements, and electrical conduit. Potential impacts are anticipated in the areas of air quality, hydrology, biological resources (approximately 2.7 acres of impact to riparian habitat), and aircraft operations during construction. A previously prepared EA has been updated to address the impacts associated with this project. The project is the subject of a separate Section 7 Endangered Species Act consultation (re-initiation) with the USFWS, and is anticipated to be completed in September 1998.

Highbay Warehouse Phase II (P-050)

This project would construct a highbay automated warehouse as a follow-on to the warehouse constructed under BRAC. Construction of this project is projected for 1998. This facility satisfies the aviation supply requirement related to existing deficiencies. Potential impacts are anticipated in the areas of air quality during construction, surface hydrology, and visual resources. This action has been categorically excluded from NEPA analysis.

Ultimate Clear Zone (PA 303M)

Aircraft operation safety guidelines established by Naval Air Systems Command (NAVAIR) requires that a zone cleared of all obstructions be established at the end of all active runways. This Ultimate Clear Zone shall extend 500 feet on either side of the center line of the runway and overrun and shall extend 1,000 feet from the end of the runway. Construction activity under this project would include clearing all vegetation except grass within this 27-acre area (1,000 feet by 1,000 feet). Mitigation measures will be established as part of the NEPA process in accordance with terms of the BO. Currently, this project is programmed but not funded. The environmental documentation for this project has not begun.

Convert Short Approach Landing System to Airfield Lighting Sequence Flashing System (PA 403R)

This project would upgrade the Short Approach Land System (SALS) approach lighting to an Airfield Lighting Sequence Flashing System (ALSF-1). Each lighting unit of the ALSF-1 system would consist of support poles with cross arms for the light mountings. Work would need to be completed during the dry season (including part of the breeding season), in order to facilitate construction access within the river. The project has not been scheduled for construction, and is unfunded.

Communications/Electrical Infrastructure (P-004)

This project was originally programmed for FY 1995 and construction is now completed. Construction involved the installation of approximately 18,000 linear feet of underground electrical duct bank with cables. The system replaces aging infrastructure supporting airfield lighting, radar and weather equipment, and primary electrical distribution for buildings and telephones. Potential impacts were identified for resources including air quality during construction and hydrology. A categorical exclusion was completed for this project (Figure 5-1).

Western Wire Mountain Family Housing

This project, located on the north and south sides of Wire Mountain Road, would provide additional critically needed on-base military family housing for enlisted service members (E-4 to E-9). The proposed development would provide between 300 to 400 housing units, including 'tot lots' and open space areas. Infrastructure improvements would also be included with the project. This action is planned for 1999. An EA has been initiated, but not completed, for the proposed Western Wire Mountain Family Housing development.

DeLuz Family Housing

This project, located just south of the Naval Weapons Station, Seal Beach – Fallbrook Annex, would provide additional critically needed on-base military family housing for enlisted service members (E-1 to E-9). The proposed development would provide up to 254 housing units, including tot lots and open space areas, and renovation or replacement of 512 existing dwelling units. Infrastructure improvements would also be included with the project. This action is planned for 1999. An EA has been initiated, but not completed, for the proposed DeLuz Family Housing development.

San Mateo Point Family Housing

The construction of 120 duplex, company grade officer housing units (60 duplexes) in two phases (76 units and 44 units) is ongoing at San Mateo Point in the northern area of MCB Camp Pendleton. The Finding of No Significant Impact (FONSI) was issued in January, 1997, and completion of the project is anticipated in February, 1999.

Northern Power Distribution System (P-046)

This project would include three new 12 kilovolt (kV) power distribution lines and upgrades of two 4 kV power distribution systems to 12 kV power distribution systems. The three new power distribution lines would be as follows: (1) one line would run approximately 5.4 miles from Haybarn substation northeast to the boundary with the Naval Weapons Station, Seal Beach - Fallbrook Annex then east along that boundary to the eastern boundary of the Base, traversing the northern edge of the site for the proposed new DeLuz housing; (2) a second line would run approximately 5.2 miles from Haybarn substation south to the Base boundary; (3) a third line would run approximately 4.1 miles (6.6 kilometers) from the Las Pulgas substation north along El Camino Real to connect with a 12 kV SDG&E line feeding MCB Camp Pendleton (Figure 5-1). Along most of the alignments, new lines will parallel existing SDG&E lines and be accessed via existing paved roads or unpaved access roads. This action would also include the installation of two new voltage regulators, power distribution system upgrades for the 13 and 21 Areas, and new 69 kV metering stations would be installed at Stuart and Las Pulgas substations. This action would reduce electrical energy costs for MCB Camp Pendleton by improving the reliability of electrical power distribution, reducing energy consumption on-base, and allowing the Base to purchase electrical power at a cheaper transmission rate (69 kV). At this time, the NEPA documentation for the project has not been completed. Biological and cultural resources analyses are currently being performed for this project.

Santa Rosa Water Reclamation Facility 2 MGD Discharge Demonstration Project

The project, which began in December, 1997, occurs upstream from the Santa Margarita River, on the Murrieta Creek tributary located approximately 10 miles off base to the northeast. The project discharges 2 MGD of tertiary treated and disinfected reclaimed water to Murrieta Creek from the Rancho California Water District (RCWD) Santa Rosa Water Reclamation Facility (SRWRF) and provides for monitoring to determine the impacts of such discharge.

The facility currently provides secondary treatment through a sequential batch reaction process. This method of secondary treatment, with methanol addition, achieves a high level of removal of nitrogen

and phosphorous compounds. The SRWRF also provides chemical addition, tertiary coagulation and filtration, chlorination, and dechlorination. The discharged reclaimed water complies with unrestricted body contact criteria set forth in Title 22, Division 4, of the *California Code of Regulations* (Title 22). Two MGD of the reclaimed water is introduced into Murrieta Creek and flows into the Santa Margarita River. SRWRF reclaimed water production in excess of 2 MGD is directed to existing percolation and water reuse operations. An NPDES permit was obtained for this project from the RWQCB and EPA. At the 2 MGD demonstration flow rate, the reclaimed water reaches Camp Pendleton only when there is surface flow. In normal dry seasons, the discharge drains to the groundwater north of the Base.

To address stream discharge issues, the RCWD, MCB Camp Pendleton, the Fallbrook Public Utility District (FPUD), and the Eastern Municipal Water District (EMWD), cooperated in a comprehensive study of reclaimed water stream discharge scenarios and impacts. The results of this effort were presented in the *Santa Margarita River Basin Water Quality Protection Study*, and a Four Party Agreement was established. In addition to allocating reclaimed water production of the EMWD and the RCWD, the Four Party Agreement established provisions under which EMWD and RCWD would provide reverse osmosis well-head treatment of downstream groundwaters.

As part of the agreement, the 2 MGD project required monitoring and evaluation on the environmental and health impacts downstream from the discharge from Murrieta Creek to the Santa Margarita Estuary. In compliance with the NPDES permit, the RCWD is performing this monitoring at several points along the river, including two surface water points on base and at the Camp Pendleton Santa Margarita River potable water wells.

The 2 MGD demonstration project is the only part of the agreement currently being implemented. The demonstration project includes plans to increase the amount of discharge to approximately 15 MGD. However, any future increase will require new environmental evaluation considering the observed effects of the present demonstration project. A discharge of 15 MGD would reach the Base during the summer and would add to the groundwater recharge.

San Onofre Area (P-527A) and San Mateo/Las Pulgas (P-529) Sewage Effluent Compliance Projects

The two other sewage effluent compliance projects at MCB Camp Pendleton are the San Onofre Area project and the San Mateo/Las Pulgas project. These projects had independent environmental documentation completed. A brief description of each project is provided below; more detailed information is contained in the MCB Camp Pendleton Master Plan.

Sewage effluent compliance is required at four other treatment plants on-Base, located within the San Onofre Area and the Las Pulgas/San Mateo areas. In order to comply with the Basin Plan, treated sewage effluent, currently discharged to groundwater and surface water, would be discharged downstream of potable water supply wells via pipeline. With respect to the Las Pulgas/San Mateo project, the treated effluent would be disposed by means of equalization basins and injection wells. A Final EIS for this project was completed in April 1997. Construction is scheduled to be completed in April of 1999. Treated effluent associated with the San Onofre project would be disposed by means of percolation basins downstream of potable water supply wells. A Final EIS for this project was completed in June 1995. Construction of this project has been completed.

Installation Restoration (IR) Program

A *Proposed Plan for Remedial Action at Operable Unit 3 Sites* (Southwest Division 1998b) was completed in May 1998 based on environmental investigations and risk assessments conducted to identify potential contamination from past disposal practices. This Plan was prepared in accordance with Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act (SARA). With the signing of the ROD for Operable Unit 3 sites at MCB Camp Pendleton, the Installation Restoration Program at Camp Pendleton will have closed 80 percent of its sites. Remaining activities include: remediation of six sites with soil contamination; a phase III investigation of soil on one site; four sites with groundwater contamination; and a removal action at the Box Canyon Landfill which will be capped. Since the soil contaminated sites are contained and are being evaluated, it is only the groundwater contamination sites that might represent a cumulative impact when viewed in connection with the Proposed Action which includes groundwater discharge of treated effluent.

Ysidora Flats Effluent Outfall/Groundwater Recharge Program

Installation of a valve in the existing pipeline adjacent to Vandegrift Boulevard at the BRAC/Levee projects' wetland mitigation site at Ysidora Flats would facilitate future discharge of treated effluent into the Santa Margarita River. This future project would be designed to recharge the groundwater should lowered groundwater levels from removal of the existing discharges (see Section 3.1.3) impact the BRAC/Levee wetland mitigation site. Since this discharge is not a part of Alternative 2 (the preferred alternative), it would be subject to further environmental review. Potential significant impacts from this future project would primarily involve effects to water quality and biological resources.

5.2 ENVIRONMENTAL ANALYSIS

The other planned actions discussed in Section 5.1 above were evaluated for cumulative impacts related to the environmental resources discussed in this FSEIS. The localized nature of certain environmental effects, the short-term nature and timing of the construction effects, and comprehensive basewide policies for managing environmental resources and mitigation of impacts are all factors which were considered in the significance of cumulative impacts. The potential cumulative impacts for each of the environmental resources are discussed below.

NEPA requires only a discussion of those cumulative impacts with the potential for significance. As indicated in the project descriptions each of the projects have addressed potential environmental impacts in the project-specific NEPA documentation. Most of the potential impacts of these projects are either below a level of significance or have been mitigated to a level below significance. The following discussion of cumulatively significant impacts considers those impacts that may not be individually significant, but may be cumulatively significant for the resources affected.

The long-term impacts of the proposed action on cultural resources, public health and safety, socioeconomics, environmental justice/protection of children, geology and soils, land use, noise, transportation and vehicular circulation, visual resources, and utilities would not be significant or would be reduced to a level below significance through mitigation measures. These resource areas would not contribute to significant cumulative impacts and accordingly, are not analyzed below.

The following environmental analysis focuses on those projects proposed on Base that, in conjunction with the proposed action, have the potential to cumulatively affect water quality/ quantity, air quality, and biological resources. These potential effects are analyzed below.

5.2.1 Water Quality/Quantity

In order to address the potential cumulative effects of the sewage effluent compliance projects in four basins at MCB Camp Pendleton, a Groundwater/Riparian Study was completed (MCB Camp Pendleton 1995). Groundwater models were utilized to determine the effect of removal or relocation of treated effluent discharges in the Lower Santa Margarita, Las Pulgas, San Mateo, and San Onofre Basins. The models determined the potential effects on groundwater levels and the resultant effects on riparian vegetation and endangered species in the four basins. The analysis concluded that there would not be any cumulative, adverse effects on groundwater levels in the four basins as a result of the proposed sewage effluent compliance projects. (Potential effects in the Lower Santa Margarita Basin are addressed in Chapter 4.0 of this FSEIS).

The groundwater analysis also included a qualitative analysis of the cumulative effects of the proposed action and the flood control levee project on groundwater resources in the Lower Santa Margarita Basin. The levee would protect the adjacent MCAS Camp Pendleton from major flood events in the Santa Margarita River. The levee could reduce the amount of groundwater recharge during major storm events, but the groundwater analysis concluded that this would not be a significant effect on groundwater availability in the basin. There would be no cumulative groundwater effects from these two adjacent projects in the Lower Santa Margarita Basin.

The Final EIS for the BRAC project determined that the addition of new personnel could result in potential long-term overdraft of groundwater resources (U.S. Navy 1996). Mitigation measures for the BRAC projects, including limitations of water supply to the safe yield of groundwater sources, and implementation of water conservation measures to reduce and control water demand would be sufficient to reduce any significant impact to a level below significance. Therefore, there would not be any significant cumulative impacts to groundwater levels.

The water wells project (P-659) would not result in significant impacts on the supply of groundwater, because the wells do not generate the water demand. The proposed wells would simply increase the reliability of the water supply system to deliver the required water supplies. In addition, the upgraded well systems, with sanitary seals and pumps elevated above the 100-year flood level, would alleviate impacts to groundwater quality. The EA assumed that water withdrawals would be limited to the safe yield of the aquifer. This is the same assumed mitigation measure adopted by other major projects (i.e., BRAC) that would affect water demand.

The water supply necessary for the three (Western Wire Mountain, DeLuz, and San Mateo Point) family housing projects would be accommodated by existing and future connections to Base and Tri-City Municipal Water District (TCMWD) water sources. The Western Wire Mountain and DeLuz projects may be accommodated with existing Base water supplies without reaching safe yield limits. The San Mateo Point Project would use TCMWD sources without reaching safe yield limits. Therefore, water supply would not be affected in a cumulative sense. In addition, potential water supply impacts in the future would continue to be analyzed on a project-by-project basis. Construction of the new water production wells (P-659), scheduled for completion in mid-1998, would produce from 3,500 to 5,000 gpm of potable water for MCB Camp Pendleton. This action would not increase consumption on-Base; rather, the wells would serve to increase the production capacity of MCB Camp Pendleton. Therefore, no significant cumulative impacts would occur to water quantity.

The Western Wire Mountain site is served by STP 13. The capacity of STP 13 would be improved with the two recommended improvements described in the *Draft Wire Mountain Housing Capacity Study, Sewage Treatment Plant No. 13 (Twin Lakes)* (U.S. Navy 1998d). The two improvements would be: (1) to construct an additional chlorine contact tank; and (2) to install a heating system for two primary anaerobic digesters at the plant. The existing sewer gravity main from the DeLuz site to the STP 1 is adequate to handle the additional effluent generated by the housing development. However, the existing sewer lift station within the DeLuz housing area does not have the capacity to handle the additional effluent and would require replacement with a larger capacity station. By disposing of sewage effluent via percolation basins, irrigation, or disposal to the river after advanced treatment, the combined sewage effluent disposal projects in the four major basins on the Base would cumulatively decrease the likelihood of degraded water quality in potable water wells downstream of the STPs. Thus, a cumulatively beneficial impact on surface and groundwater quality would result.

In complying with the RWQCB Cease and Desist orders, MCB Camp Pendleton proposes to terminate existing reclaimed water discharges within the lower Santa Margarita River basin. This proposed action would result in the reduction by approximately 2 MGD of the amount of water recharged to the downstream portions of MCB Camp Pendleton's groundwater basins. The SRWRF 2 MGD reclaimed water stream discharge predominantly recharges only the most upstream portions of the basins on the Base. The proposed 2 MGD SRWRF stream discharge would not result in any net increase in reclaimed water contributions to the Base's groundwater basins because the reclaimed water reaches Camp Pendleton only when there is surface flow. In normal dry seasons, the discharge drains to the groundwater north of the Base. Thus, it would not contribute to cumulatively significant impacts to water quality or quantity.

None of the four identified IR program sites containing contaminated groundwater are located in the Lemon Grove area or are in such proximity that they would be impacted by effluent discharged to groundwater through the Lemon Grove ponds. Pipelines which carry effluent to the ponds from STPs 1, 2, 3, 8, and 13 would not traverse any of the active contamination sites.

If the Ysidora Flats Effluent Outfall/Groundwater Recharge Program is implemented, disposal of treated effluent at the Ysidora Flats mitigation area has the potential for adverse impacts to surface water quality. Although the advanced wastewater treatment would meet the criteria for unrestricted irrigation of landscape, nutrient concentrations would be expected to exceed the Basin Plan objectives for surface and ground water quality. There is also the potential for observable nitrogen toxicity from ammonia or other toxicants. These impacts would be less than significant since the discharge activity would be designed to recharge the groundwater in a manner that would benefit the

restored wetland habitat. This discharge would be planned and monitored in accordance with a program which would be approved and permitted by the cognizant resource agencies as required for Alternative 3 in Section 4.1.3. Negative impacts to the wetland habitat or Basin Plan water quality objectives would result in the cessation of discharge at Ysidora Flats and the diversion of STP 1 and 2 effluent discharge to the Lemon Grove ponds.

The advanced wastewater effluent discharged at Ysidora Flats during the dry seasons would be absorbed locally and would not reach the estuary. During a wet season, effluent discharges may reach the estuary by inclusion into surface waters flowing in the Santa Margarita River. The discharge would be diluted by the river water, and the impact on the estuary would be less than significant.

5.2.2 Air Quality

The other on-Base projects, when considered with the proposed action, would not have a long-term cumulative impact on air quality. Construction associated with the other projects, however, may occur in the same timeframe as construction for the proposed action and result in a short-term adverse effects on air quality. This potential cumulative impact would be mitigated through site-specific measures.

The proposed action and each of the other proposed actions (P-010, P-562, P-659, and BRAC) would each be in conformity with the State Implementation Plan (SIP) of California for O_3 and its precursors (VOCs and NO_x). These are the only criteria pollutants that San Diego Air Basin (SDAB) is currently in nonattainment for NAAQS. At the peak of construction activities for all projects that would occur between 1998 and mid-1999, none of the annual project emissions would individually exceed the *de minimis* threshold for VOC or NO_x of 50 tons per year, or the threshold of 100 tons per year for CO. Cumulatively, the emissions from the various projects, including the proposed effluent disposal action, may exceed these thresholds. However, the effluent disposal facilities construction would last on the order of six months to one year, and the emissions would cease. Therefore, the impact would be considered cumulatively adverse, but not significant.

Air emissions from diesel-powered pump operations at the emergency pump station associated with the flood control project (P-010) would be below the *de minimis* threshold for VOC and NO_x. The resulting contribution of emissions in the air basin would be within total projected emissions associated with the growth in power consumption, and would not result in a significant cumulative impact. The BRAC activities would generate higher operational emissions due to aircraft, aircraft equipment, motor vehicles, and living quarters. However, the estimated annual emissions for the

BRAC proposed action were found to be substantially below the significance threshold level (U.S. Navy, 1996). None of the proposed projects would contribute total annual emissions of more than 10 percent of the regional emissions in SDCAPCD. Long-term direct emissions from operations of the proposed effluent disposal facilities would be limited to the small number of vehicles used by operating and maintenance personnel. With the small amount of direct emissions attributable to the proposed effluent disposal action, the contribution to long term cumulative air quality impacts would be considered less than significant.

5.2.3 Biological Resources

Because the proposed actions would occur in the lower Santa Margarita Basin, one of MCB Camp Pendleton's most sensitive biological resources, project construction and operation activities may have potential significant cumulative impacts on biological resources. To address the potential significant cumulative impacts to these sensitive biological resources, MCB Camp Pendleton has consulted with the USFWS on a Riparian and Estuarine Ecosystem Conservation Program. A Biological Assessment (BA) (MCB Camp Pendleton 1994) and subsequent Biological Opinion (BO) (USFWS 1995b) were prepared addressing the programmatic impacts and mitigation requirements for various projects in these ecosystems on MCB Camp Pendleton, including those identified above. MCB Camp Pendleton will apply this programmatic consultation to all ongoing and future actions in the Santa Margarita River basin, as they potentially affect the integrity of riparian and estuarine/beach ecosystems. Thus, the BO addresses the potential cumulative aspects on federally listed and proposed species from the Santa Margarita River Flood Control Project, Basilone Road Bridge Replacement, the Water Wells Project, and this proposed action, the Sewage Effluent Compliance Project, encompassed in the FEIS/R. The BO also establishes a procedure for addressing future actions that were not covered under the initial BA. Although this project has changed as reflected in this FSEIS, the mitigation measures required under the BO have been employed. Biological resources affected by the proposed BRAC activities have been evaluated in a separate EIS, and required separate concurrence from the USFWS to meet Section 7 requirements of the Endangered Species Act (U.S. Navy, 1996).

Direct impacts from future installation of an outfall structure at Ysidora Flats would not be significant because no sensitive plant or animal species occur in this area. Indirect impacts could arise from the increased effluent discharge and from increased nutrient loading which could adversely affect the habitat being created. Discharge of too much effluent could convert the mitigation area from willow woodland to freshwater marsh. Similarly, increasing the nutrients on the site could shift the competitive balance from native species to non-native species. Conversion

of habitat type and/or increasing the presence of non-native species as a result of effluent discharge would be a significant impact.

In accordance with the BO (USFWS 1995b), the mitigation site at Ysidora Flats would be designed and monitored in conjunction with long-term monitoring programs for the BRAC/Levee projects. These impacts would be less than significant since the discharge activity would be designed to recharge the groundwater in a manner that would benefit the restored wetland habitat. This discharge would be planned and monitored in accordance with a program that would be approved and permitted by the cognizant resource agencies as required for Alternative 3 in Section 4.3.3. Negative impacts to the wetland habitat would result in the cessation of discharge at Ysidora Flats and the diversion of STP 1 and 2 effluent discharge to the Lemon Grove ponds.

The permanent long-term effects of P-010, P-030, P-659, and P-527 would result in cumulative impacts to biological resources. However, USFWS has determined that these projects would not jeopardize the continued existence of the three federally-listed endangered species (i.e., the arroyo southwestern toad, the least Bell's vireo, and the southwestern willow flycatcher) and one federally listed threatened species (i.e., the California gnatcatcher) that occur in the collective area of potential effect for these projects. Through the implementation of various habitat enhancement and management features of MCB Camp Pendleton's Comprehensive Riparian Conservation Program and project-specific habitat replacement mitigation measures, direct and cumulative impacts would be minimized. Wetlands impacts from P-010 were coordinated with the USACOE as a separate process under the Clean Water Act (Section 404 permit). Mitigation measures for each of the other projects have been addressed in completed environmental documents or would be addressed in subsequent environmental documents in accordance with the terms of the BO.

Permanent loss of natural habitats following construction of the approved portion of P-527B were associated primarily with creation of the new ponds in the Lemon Grove area. Effects, if any, on regional wildlife movement would be mostly temporary and minimal. In light of measures incorporated into the project design to avoid, minimize, and mitigate losses of biological resources, the cumulative effects of the project on biological resources would not be significant.

A cumulative increase in temporary ambient noise levels during construction within active nesting habitat of the least Bell's vireo and the southwestern willow flycatcher would not occur, as all construction, except that associated with P-010 and P-030, would occur outside of the breeding season.

Although the proposed action would contribute to the cumulative impacts of habitat loss and wildlife movement in the region, impacts would be minimized due to the following measure:

- MCB Camp Pendleton has prepared a BA that provides a comprehensive inventory of riparian biological resources and evaluates potential cumulative impacts on those resources, resulting from the construction of a number of projects planned at MCB Camp Pendleton in the reasonably foreseeable future. The goal of the BA is to avoid or minimize cumulative impacts to biological resources. The BA is also used as a tool to plan and design proposed projects with the intent of preserving and maintaining, to the greatest extent possible, biological resources throughout the Base. The USFWS issued a BO in October 1995 that concurred with the implementation of basewide management programs to minimize cumulative effects to riparian resources. Therefore, cumulative impacts on the biological resources in the region associated with the proposed action would not be significant.

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CHAPTER 6.0
OTHER CONSIDERATIONS REQUIRED BY NEPA

6.0 OTHER CONSIDERATIONS REQUIRED BY NEPA

6.1 SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

NEPA requires an EIS to address the relationship between short-term uses of the environment and the impact that such uses may have on the maintenance and enhancement of the long-term productivity of the affected environment. Of particular concern are impacts which would narrow the range of beneficial uses of the environment. This refers to the possibility that choosing one development option would reduce future flexibility in pursuing other options, or that giving over a parcel of land or other resource to a certain use would eliminate the possibility of other uses being performed at that site.

Short-term effects from project construction would include impacts to air quality. Short-term impacts to air quality would result from increased engine exhaust fugitive dust (PM_{10}) emissions. However, minor and short-term emissions would cease upon completion of construction, and would not hinder the projected attainment of the national ozone standard in San Diego County. This negligible impact would be short-term and would not affect the long-term productivity of this resource.

A long-term loss of biological resources would occur from implementing the proposed action. The impacts and compensatory mitigation for these impacts would not interfere with the long-term productivity of these resources.

The long-term loss of water resources (effluent discharge) in the basin north of STP 13 would be offset by the effect of the discharge at Lemon Grove, which would be the enhancement of a barrier to salt water intrusion. There would be no adverse impact to the long-term productivity of the environment.

6.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

NEPA requires an analysis of significant irreversible effects. Resources which are irreversibly or irretrievably committed to a project are those that are utilized on a long-term or permanent basis. This includes the use of non-renewable resources such as metal, wood, fuel, paper, and other natural or cultural resources. These resources are non-retrievable in that they would be utilized for the proposed action, when they could have been conserved or utilized for other purposes. Another impact which falls under the category of the irreversible and irretrievable commitment of resources

is the unavoidable destruction of natural resources which could limit the range of potential uses of that particular environment.

The construction of the proposed action would result in an irretrievable commitment of building materials and fuel for construction vehicles and equipment. In addition, the proposed action would commit work force time for construction, engineering, environmental review and compliance, and, after project completion, operation and maintenance. Operation and maintenance would be expected to require the provision of three full-time jobs per year to oversee the system of pumps, pipelines, and associated facilities.

In summary, the commitments of the proposed action which would be considered irreversible would be the use of the material resources and human labor to construct and operate the facilities. These commitments are not considered to be significant.

There would also be irreversible loss of biological habitat and visual resources with implementation of the proposed action. However, with the mitigation measures prescribed in this document, these impacts would not be significant.

CHAPTER 7.0
LIST OF PREPARERS

7.0 LIST OF PREPARERS

Tom Larkin
B.A., Zoology
Years of Experience: 23

Jim Kurtz
B.S., Engineering
Years of Experience: 26

Christina Schaefer
M.L.A., Landscape Architecture
Years of Experience: 10

Jack White
M.A., Geography
Years of Experience: 25

Karen Sievert
B.A., Geography
Years of Experience: 20

Jerry McLees, AICP
M.P.A., Public Administration
Years of Experience: 30

Shawn Shamlou
M.A., Geography
Years of Experience: 5

Andrew York
M.A., Cultural Resources Management
Years of Experience: 14

Lyndon Quon
B.A., Ecology
Years of Experience: 7

John Messina
M.S., Ecology
Years of Experience: 6

Angela Johnson
B.A., Graphic Design
Years of Experience: 6

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CHAPTER 8.0
PUBLIC COMMENTS AND RESPONSES

8.0 PUBLIC COMMENTS AND RESPONSES

The CEQ Regulations (40 CFR 1503.1) implementing NEPA state: "After preparing a draft environmental impact statement the agency shall:

(1) Obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved or which is authorized to develop and enforce environmental standards.

(2) Request the comments of:
   - (i) Appropriate State and local agencies which are authorized to develop and enforce environmental standards;
   - (ii) Indian tribes, when the effects may be on a reservation; and
   - (iii) Any agency which has requested that it receive statements on actions of the kind proposed.

(3) Request comments from the applicant, if any.

(4) Request comments from the public, affirmatively soliciting comments from those persons or organizations who may be interested or affected."

The CEQ Regulations (40 CFR 1503.4) further require that: "An agency preparing a final environmental impact statement shall assess and consider comments both individually and collectively, and shall respond by . . . stating its response in the final statement."

In compliance with these regulations, the Commanding General USMC Base Camp Pendleton, through the Southwest Division, Naval Facilities Engineering Command in San Diego, released the SEIS for a 45-day public review and comment period on September 11, 1998. Copies of the SEIS were sent to agencies, organizations, and individuals listed on the mailing list which follows below. Copies were also sent to public libraries in Oceanside, CA; Fallbrook, CA; Temecula, CA; and San Diego, CA. A Notice of Availability was also published in the *Federal Register* on September 11, 1998, to commence the public review period which continued through October 26, 1998.

A public hearing was also held on October 14, 1998 in Oceanside, California at which the Marine Corps presented the findings of the SEIS and invited public comments. Notification of the public hearing was published in the *San Diego Union-Tribune, Californian* (Temecula) and the *North County Times* (San Diego) approximately one month prior to the public hearing. No questions or public comments were received during the public hearing.

This chapter provides a summary of the comments received during the public review period. Table 8-1 provides an index of comment letters received; and a copy of each letter is included at the end of this chapter. Each letter was given a document number and was reviewed and analyzed. Specific comments were highlighted and numbered in the margin of the enclosed letters. A verbatim transcript or summary of these comments, by document and comment number, is provided in Table 8-2, with a response provided to each comment. Where changes were made to any of the alternatives described in Chapter 2.0, or elsewhere within the SEIS, these changes are noted in Table 8-2.

Table 8-1
Index of Comments

Doc.	Author	Affiliation
1	Robert E. Reynolds	San Bernardino County Museum
2	Deanna M. Wieman	U.S. Environmental Protection Agency Region IX
3	John Gomez	California Indian Legal Services
4	Patricia Sanderson Port	U.S. Department of the Interior
5	James W. Royle, Jr.	San Diego County Archaeology Society

Table 8-2
Response to Comments

Doc. No.	Comment No.	Comment	Response
1	1	The EIS fails to consider non-renewable paleoresources. The project is located on Eocene, Miocene and Pleistocene sediments known to contain significant non-renewable paleontological resources. A qualified vertebrate paleontologist must be retained to develop a mitigation program which conforms to the guidelines of the Society of Vertebrate Paleontologists and includes: 1) A pre-construction field assessment; 2) monitoring of excavations in areas likely to contain paleontologic resources; 3) preparation of recovered specimens; 4) identification of recovered specimens; and 5) preparation of a report of findings.	Potential impacts to paleoresources are addressed in Section 4.7, Geology and Soils. Monitoring, recovery and curation are required as mitigation measures and are also addressed in Section 4.7.
2	1	We have rated this DSEIS EO-2 – Environmental Objections-Insufficient Information. This rating reflects our objections over potential adverse impacts to waters of the U.S. and Special Aquatic Sites and/or a violation of Clean Water Act standards from proposed groundwater discharge at Lemon Grove ponds and from surface discharge at Ysidora Flats.	This comment is addressed in the following responses to the comments received from U.S. EPA. The FSEIS has been modified in response to these comments.
2	2	EPA is pleased to note that the DSEIS reflects more optimal use of the area's valuable water resources than proposed in the FEIS/R.	Comment noted.
2	3	Effluent discharge at Ysidora Flats may disturb a designated wetlands mitigation area and impact its functions and values. EPA recognizes the value in maintaining groundwater recharge and surface flows within the middle and upper portions of the Santa Margarita Basin. We concur with the USFWS scoping letter that groundwater lowering may result in the degradation and/or loss of downstream wetland habitats especially during extended periods of drought. The USFWS recommended that Navy consider use of tertiary treated water to facilitate wetland establishment at the Ysidora Flats mitigation site. EPA's current objections stem from the potential for effluent surplus to have an impact on the recruited riparian vegetation within the mitigation area, which could create freshwater marsh habitat. Any alteration of the Ysidora riparian wetlands mitigation site habitat. Any alteration of the Ysidora riparian wetlands mitigation site through excess effluent discharge or nutrient loading could alter the functions and values of these Waters and the intent of the mitigation plan. According to the DSEIS, increasing the nutrients on the site could shift the competitive balance from native species to non-native species and the advanced secondary treatment of effluent per the preferred alternative 2 would not eliminate nutrients.	The preferred alternative would include discharge of treated effluent at the golf course and Lemon Grove ponds. Although the Alternative 2 (the preferred alternative) in the DSEIS discussed the possibility of discharge at Ysidora Flats, MCB Camp Pendleton does not intend to discharge at that location at this time. The preferred alternative in the FSEIS has been modified to clarify this change. In the fall of 1997, as part of the implementation of the Final Baseline Summary Report BRAC Wetlands Mitigation Project (BRAC mitigation), MCB Camp Pendleton removed the old berms at the former Ysidora Ponds in order to reestablish the natural floodplain of the Santa Margarita River. In addition, the flow from the Pueblitos Canyon was redirected into the Ysidora Flats mitigation site. These actions have proven successful in the initial reestablishment of riparian habitat at Ysidora Flats. Other potential impacts associated with the planned elimination of current effluent discharge from STP 3 to the Santa Margarita River are addressed in Section 4.2.1.1 of the FEIS/R (pages 4-8 to 4-12). As a part of the BRAC and the Santa Margarita River Flood Control and Bridge Replacement Projects Mitigation

Doc. No.	Comment No.	Comment	Response
			(Levee/Bridge), MCB Camp Pendleton has instituted a monitoring plan for the Ysidora Flats area. The BRAC and Levee/Bridge projects. mitigation have established success criteria for hydrology and woody species recruitment in Ysidora Flats. The effect of the BRAC and Levee/Bridge mitigation plans would be to offset the loss of effluent discharge from STP 3 in the Ysidora Flats Area by introducing these additional sources of water from Pueblitos Canyon and the Santa Margarita River. Nevertheless, MCB Camp Pendleton believes there may be a potential benefit to recharging the groundwater at Ysidora Flats which reclaimed STP effluent, although no such system has been proposed at this time. Accordingly discharge at Ysidora Flats would be accomplished through a separate project. MCB Camp Pendleton would work in cooperation with the USFWS, USEPA and USACOE to determine the appropriate location, design, and operational features of any future discharge system to assure that the discharge infiltrates into the groundwater and does not become surface flow or convert riparian vegetation to fresh water marsh habitat. Appropriate environmental analysis would be performed before any future project was to be undertaken. The comment correctly identifies the potential impacts of Alternative 3. MCB Camp Pendleton will implement the monitoring program described in Section 4.3.3 Mitigation Measures. If the monitoring indicates adverse effects resulting from Alternative 3, the Marine Corps, after appropriate consultation and preparation of necessary environmental documentation, would seek funding from Congress to add tertiary treatment and nutrient removal at STPs 1, 2, 3 and 8.
2	4	The chemical composition of groundwater-recharged sewage effluent at Lemon Grove could adversely affect the coastal estuary environment.	Groundwater/solute transport calculations were done by Group Delta Consultants as part of the pilot test basin study. The study modeled the disposal of an average of 3 MGD at Lemon Grove. Based on this groundwater/solute transport modeling approximately 90% of the effluent disposal would flow through high conductivity terrace deposits under Camp Del Mar and southwest to the ocean, rather than northwest through the low permeability river deposits toward the estuary. The remaining 10% would be added to the existing groundwater flow beneath the estuary. Model results indicate that total nitrogen concentrations in ground water as a result of effluent discharged to the water table, would have a concentration of less than 1 mg/liter in the vicinity of the river and approximately 1 mg/liter

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			where it discharges to the ocean. Therefore, the total nitrogen composition would be significantly reduced from the 21 mg/liter currently being discharged into the Santa Margarita River from STP 13. Model results indicate that total phosphorous concentrations in ground water as a result of effluent discharged to the water table would have a concentration of less than 0.25 mg/liter in the vicinity of the river and approximately 0.25 mg/liter where it discharges to the ocean. Therefore, the total phosphorous composition would be significantly reduced from the 5.8 mg/liter currently being discharged into the Santa Margarita River from STP 13. Based on the results of this modeling, modifications have been made to the design of the vertical drains, which would now be cased to an elevation of 0 feet MSL and extend to a depth of elevation –25 MSL in order to discharged directly to the groundwater (see Section 2.2.1). Accordingly, the hydrology and water quality impacts of Alternatives 1 and 2 have been reevaluated and revisions have been made to Section 4.1 of the FSEIS. MCB Camp Pendleton would conduct monitoring of surface and groundwater quality in open water areas and the salt water marsh for compliance with Basin Plan Mineral Objectives, and for nitrogen and phosphorous in the salt water marsh and estuary. This monitoring and reporting program has been added in Section 4.1 of the FSEIS. MCB Camp Pendleton recognizes the value of developing long term improvements to address water quality and quantity issues. Accordingly, MCB Camp Pendleton intends to submit a request to Congress for funding of tertiary treatment, and nutrient removal as necessary, of all effluent on the base.
2	5	There is insufficient information in the DSEIS to predict direct, indirect, and cumulative impacts from groundwater recharge at Lemon Grove. Our objections could potentially be alleviated by providing additional information in the FSEIS.	Data from the Test Basin Study has resulted in a refinement in the design of the Lemon Grove ponds, including adding cased drains as described in the response to comment 2-4, above. The purpose of the cased drains would be to convey the effluent discharge to the groundwater table where it would mix with the groundwater rather than remaining undiluted atop the groundwater table or experience lateral seepage of undiluted effluent to surface at the river bluff face ("daylighting"). Also see the response to comment 2-4 with regard to the effects of this discharge and the changes that have been made to the FSEIS as a result of the test basin modeling data.

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2	6	The benefits to the groundwater system are questionable because, according to the DSEIS, the Ysidora Flats area has poor percolation capacity. EPA recommends that the discharge of effluent described in alternatives 2 and 3 as "groundwater recharge" be relabeled as surface discharge with potential for some groundwater recharge.	See response to comment 2-3, above. The discharge of treated effluent proposed in alternative 2 would not occur. The comment correctly notes that the potential for groundwater recharge in the Ysidora Flats area would be through surface discharge for alternative 3.
2	7	Proposed mitigation for impacts at Ysidora Flats relies heavily on monitoring. Monitoring should not be confused with mitigation.	See response to comment 2-3, above, and the discussion in Section 5.0, Cumulative Impacts, related to any subsequent discharge at Ysidora Flats.
2	8	While Basin Plan water quality objectives, thresholds, and discharge to a standing water body values for nitrogen and phosphorous are listed in the DSEIS, we recommend that estimated nitrogen and phosphorous values for treated effluent are likewise provided in the FSEIS.	Estimated nitrogen and phosphorous values for treated effluent have been added to Section 3.1.3 of the FSEIS.
2	9	We recommend that the Navy explain how the effluent nutrient levels would meet the requirements and standards for a NPDES permit under the CWA.	As stated in Section 2.2 of the DSEIS and FSEIS, if treated effluent is to be discharged at Ysidora Flats under alternative 3, a NPDES permit and Basin Plan amendment would be required.
2	10	We recommend that the Navy re-examine its options and proposal for discharge of effluent at Ysidora Flats. This should be accomplished through accurate scientific analysis that would provide the necessary information to, if need be, modify the proposed discharge plan to either avoid impacts to the mitigation area altogether, or minimize such impacts prior to construction, rather than as possible remediation later.	See response to comment 2-3, above.
2	11	The document is insufficient in presentation of hydrogeologic information. Without this information we can only speculate that if groundwater recharge is deemed a worthy goal at Ysidora Flats, and surface percolation rates are low, then a partial solution to the problem may be through the construction of injection wells, perhaps in combination with surface discharge during dry years. We encourage the Navy to pursue this option, or state in the FSEIS why this is not feasible.	See response to comment 2-3, above.
2	12	Navy should not speculate or rely on monitoring to gauge impacts of nutrient loading, or flooding, on the Ysidora Flats area. We recommend that the FSEIS include additional analyses of expected impacts from nutrient loading and flooding, based on literature review, and if necessary, additional modeling.	See response to comment 2-3, above.

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2	13	Our objections to the proposal are based on insufficient information in the DSEIS to assure that the effluent could not enter the nearby salt marsh, a Special Aquatic Site, and cause adverse and significant impacts to the estuary ecosystem. The DSEIS states that the final field study findings would be based upon the pilot field study and modeling described in the DSEIS. Currently, there is incomplete information in the DSEIS to assure that adverse impacts could not occur.	See response to comment 2-4. Results of the Pilot Field Study and Modeling have been included in the FSEIS. Existing surface discharge to the salt marsh of undiluted secondary effluent, which now occurs from STP 13 to the Santa Margarita River, would cease with implementation of the Proposed Action. Redesign of the vertical drains, based on the field study and modeling, would result in discharge of secondary effluent within the groundwater and prevent future surface discharge of undiluted secondary effluent at all points within the salt marsh. Thus, there would be a decrease in effluent entering the salt marsh. There would be an increase in the groundwater elevation in the salt marsh area, as described in Section 4.1 of the FSEIS. The modeling predicts a dilution factor of greater than 20 to 1 for effluent in groundwater for an estimated 90 percent of the salt marsh area; therefore, the changes in groundwater salinity and nutrient concentrations due to the presence of effluent would be relatively small. These existing natural variations in salinity and nutrient content would be greater than the changes caused by the addition of secondary effluent to the groundwater. Additionally, there are no federally listed threatened or endangered species in the salt marsh area. For these reasons, it is concluded that the increase in groundwater elevation would not cause a significant adverse impact.
2	14	There is not any substantial scientific information in the document to weigh the merits of various recharge and irrigation options with respect to efficiency of the proposal in stopping salt water intrusion or other water resource related benefits.	See responses to comments 2-3 and 2-4, above. Additional analysis reflected in the FSEIS indicated the discharge of up to 3.6 MGD of effluent into the groundwater in the Lemon Grove area would provide a barrier to reduce the saltwater intrusion into the upstream groundwater. This impact would be beneficial, providing enhanced protection of potable water sources. MCB Camp Pendleton has an on-going program for monitoring of salt-water intrusion and for implementing emergency measures should problems be detected. To date, there has been no need to implement the emergency measures. Alternatives 1, 2 and 4 would all provide significant amounts of effluent to existing groundwater thereby inhibiting saltwater intrusion. Alternatives 3 and 5 would provide lesser amounts of effluent to groundwater, providing some additional protection to saltwater intrusion.
2	15	We recommend that appropriate groundwater modeling results and studies of potential effects of nutrient loading and fresh-water flooding of the coastal salt marsh be completed and presented in the FSEIS.	Groundwater modeling results have been added to Section 4.1 of the FSEIS as reflected in response to comment 2-4.

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2	16	A better understanding of the hydrogeology, percolation rates, hydraulic conductivities, etc., is necessary for a reasoned choice among alternatives. For example, it is not clear what are the advantages and disadvantages of the vertical drains (alternative 2), versus an injection well system, with or without agricultural irrigation (alternatives 4 and 5).	See Table 2-2 in the FSEIS and the response to comment 2-4, above. Results of the Pilot Field Study and Modeling have been included in the FSEIS. Alternatives 1 and 2 would comply with the deadline of the Cease and Desist Order by eliminating discharges to the Santa Margarita River and achieving compliance with the Basin Plan, within available MCON funding, without significant adverse environmental effects. Although Alternatives 4 and 5 would achieve the objectives of the Cease and Desist Order by eliminating discharges to the Santa Margarita River and comply with the Basin Plan, they would not achieve compliance with the Cease and Desist Order deadline and are beyond available funding for the project.
2	17	If either alternatives 1, 2, 4, or 5 are adopted, EPA requests that the "centroid" latitude/longitude location of the vertical drain field (technically the vertical drains are class V injection wells), or the deeper injection wells, be provided to us for an ongoing Class V injection well inventory project, under the Underground Injection Control (UIC) program.	The requested locations of any drains or injection wells will be provided to EPA for their UIC program, if this disposal method is implemented.
2	18	Figure 2-5, Alternative 1 Generalized Cross Section Schematic, appears misleading. The DSEIS states that one of the objectives of the trench would be to prevent lateral flow into the adjacent salt marsh. The drawing suggests that effluent would continue to flow into the marsh. The cross section could be much improved by using or obtaining real data and subsequently showing projected fluid flow paths.	Figure 2-5 has been revised in the FSEIS. Modification of the design of the Lemon Grove ponds and of the vertical drains will prevent lateral flow of the effluent into the adjacent salt marsh. See discussion in Section 2.2.1 of FSEIS.
2	19	Figures 2-12 and 2-14, Schematic Flow Diagrams, respectively for alternatives 4 and 5, do not show dechlorination prior to groundwater injection. The FSEIS should indicate if this step would be included in either alternative.	Dechlorination is not proposed for alternatives 4 and 5 because chlorination is needed to prevent biomass accumulation in the proposed wells.
2	20	Figure 2-8, Alternative 2 Location of Phase 2 Facilities, and the accompanying text, do not clarify whether the pipeline between STP 2 and the proposed Ysidora discharge point is already constructed, authorized in the FEIS/R ROD, or a new proposal. The FSEIS should clarify this point.	Figure 2-10 and the accompanying text in Section 2.2.2 have been revised in the FSEIS to clarify that the pipeline from STP 2 to the Vandegrift Blvd. junction was authorized in the FEIS/R ROD. There is an existing pipeline from the junction to Ysidora Flats. Discharge to Ysidora Flats is no longer part of alternative 2.
2	21	The FSEIS should provide accurate data on existing Total Dissolved Solids (TDS) levels in groundwater at the Lemon Grove Site. Table 2-3 states that percolation of secondary effluent at Lemon Grove would be permitted because the groundwater is saline. Page 4-3 (Table 4-1) provides only "postulated" existing groundwater quality data.	Because of the salinity of the water, no wells presently exist in the area of the Lemon Grove ponds. The last available well data was from 1951 (see Table 3-4) when TDS was measured at 36,100 mg/l.

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2	22	There is incomplete information in the DSEIS to indicate whether there is any stratification of the TDS in the groundwater. If there is a freshwater lens above non-potable water, deeper injection wells may be environmentally more sound than a shallow percolation facility.	Areas adjacent to the Lemon Grove ponds are subject to tidal influences.
2	23	There is no figure accompanying the discussion on page 3-5 regarding existing discharges in the project area. EPA recommends that an accurate and comprehensive figure be provided showing existing surface discharge points and the proposed discharge point at Ysidora Flats. The figure should show the location of STPs, existing pipelines, pipelines authorized in the FEIS/R ROD, and proposed pipelines.	Figure 1-1 has been added to the FSEIS to show existing effluent discharge points. Figure 2-1 has been modified to show pipelines and pump stations being built per the FEIS/R ROD.
2	24	Consistency of the proposed recharge/discharge alternatives with the Federal Consistency implementory regulations of the Coastal Zone Management Act should be described and/or acknowledged.	Additional discussion of the California Coastal Act has been added to Section 3.9.3, and impact analysis included in Section 4.9 of the FSEIS. None of the proposed alternatives would conflict with the Coastal Zone Management Act as implemented through the California Coastal Act.
2	25	DSEIS relies on implementing monitoring programs and a reactive plan of potential mitigation remedies, if and when certain adverse impacts occur from the proposed action. For example, on page 4-8 [regarding groundwater quality impacts from effluent discharge at Ysidora Flats] the DSEIS states that "mitigation of impacts to a level less than significant would be through implementation of an approved and permitted monitoring program." Monitoring should not be considered as mitigation.	See response to comment 2-3, above. For Alternative 3, an approved and permitted monitoring program would be implemented to detect positive and negative impacts of discharges at Ysidora Flats. This monitoring program would be implemented in cooperation with the USFWS, USEPA and USACOE. Section 4.1 of the FSEIS indicates, in regards to Alternative 3, that if monitoring reflects negative groundwater quality impacts as a result of effluent discharge at Ysidora Flats, such discharges would cease.
2	26	The cumulative impacts section fails to mention that Camp Pendleton is included in EPA's Superfund National Priorities List (NPL). A brief summary of the nature of the Superfund activity and the affected environment should be provided. Since some of the Superfund sites are groundwater contaminant plumes, the FSEIS should describe how the proposed groundwater recharge activities would affect the existing groundwater contamination.	Chapter 5.0, Cumulative Impacts, has been revised in the FSEIS to describe results of the Installation Restoration (IR) Program at Camp Pendleton which was prepared in accordance with Section 117(a) of the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) and the Superfund Amendments and Reauthorization Act (SARA). None of the 4 IR identified sites containing contaminated groundwater are located in the Lemon Grove area or are in such proximity that they would be influenced by effluent discharged through the Lemon Grove ponds. Therefore, there would be no cumulative impact to groundwater from the proposed actions. Piping which carries effluent to the Lemon Grove ponds would not traverse any of the active IR sites.

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2	27	Provide references to completed EISs on the previously completed sewage effluent projects at San Onofre and Las Pulgas and the success/failure of any implemented groundwater recharge projects that relate to the currently proposed activities.	Adequate data is not yet available from the San Onofre Area Sewage Effluent Compliance Project (P 527A, EIS completed June 1995) which was completed in June 1998. The new disposal systems proposed for the Sewage Effluent Compliance Project, Las Pulgas and San Mateo Areas (P 529, EIS completed December 1996) construction has not yet been completed.
2	28	There does not appear to be scientific basis in the statement [on page 5-13] that the proposed action would result in the reduction by approximately 2 MGD of water recharge to the downstream portions of MCB Camp Pendleton's groundwater basins, but would be offset by a recently initiated up-basin recharge program–and thus "would not contribute to cumulative significant impacts to water quality or quantity." There is no information on how much of the 2 MGD currently being discharged ends up in the groundwater. Furthermore, even if the quantities of groundwater recharge are the same, this does not necessarily imply that there would be no cumulative significant impacts from the proposed action. The FSEIS should further elaborate on the groundwater balance of the proposed and ongoing recharge projects and relate this to the potential to create adverse impacts, and also compare the net recharge (including proposals at Ysidora Flats) to currently projected basin safe yield.	The comment misinterprets the information provided on page 5-13 of the DSEIS. This discussion does not state that the reduction of approximately 2 MGD of water discharged in the lower basin would be offset by the recently initiated up-basin recharge program. To the contrary, the DSEIS reflects that the 2 MGD of reclaimed water discharged through the Santa Rosa Water Reclamation Facility (SRWRF) demonstration project recharges only the upper portions of the basin on MCB Camp Pendleton and that this discharge would not result in any net increase of reclaimed water contributions to the Base's lower underground groundwater basins. The 2 MGD release from SRWRF reaches Camp Pendleton only when there is surface flow. In normal dry seasons, the discharge drains to the groundwater north of the Base. The DSEIS conclusion remains valid that SRWRF discharge would not contribute to cumulative significant impacts to water quality or quantity. The impacts of the elimination of the discharge of effluent at the upstream STPs (1, 2, 3 and 8) are addressed in the FEIS/R Section 4.2.1.1 (pages 4-8 to 4-12). The analysis of these impacts is addressed in the Programmatic Groundwater/ Riparian Habitat Assessment at MCB Camp Pendleton, California (MCB Camp Pendleton 1995). The groundwater monitoring conducted in connection with the Assessment concluded that the removal of wastewater discharge would not have a discernable impact on the basins where these STPs currently discharge during average or above average years of runoff. During such years, stream flow recharge is projected to be more than adequate to maintain near normal depths of groundwater. During sustained periods of little or no surface runoff, however, ground water levels are projected to decrease in these basins, with or without the proposed action and removal of the STP discharges. Under such drought conditions, depths of water in portions of these basins may be influenced by the removal of wastewater discharges from STPs 1, 3 and 8. Groundwater levels, however, are projected to recover quickly in these areas as soon as above normal years of runoff occur. The impacts of the elimination of

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			these discharges from these STPs on riparian habitat are addressed in the USFWS Biological Opinion (1-6-95-F-02) *Programmatic Activities and Conservation Plans in Riparian and Estuarine/Beach Ecosystems on Marine Corps Base, Camp Pendleton*. Impacts on additional species are addressed in the USFWS *Biological Opinion on the Military Construction Project P-527 Santa Margarita River Area Sewage Effluent Compliance* (USFWS, October 21, 1996) in Appendix D of the FEIS/R.
2	29	The Geology and Soils section should discuss whether the proposed groundwater recharge operation at Lemon Grove could cause slope failures or induce seismic events at the site or the adjacent coastline.	The design features of the Lemon Grove Ponds used in all alternatives would preclude the potential for slope failures or induced seismic events.
2	30	Placement of the Ysidora Flats discharge site within the 100-year flood plain would appear to be inconsistent with Executive Order 11988, Floodplain Management. The FSEIS should explain why the discharge would have to be located in the flood plain and how this would be consistent with the Executive Order, particularly in view of the proposed discharge structure or multiple discharge points described on page 2-18.	It is anticipated that if Alternative 3 were implemented to allow discharge at Ysidora Flats to recharge groundwater, the facilities would be designed to be washed out in a flood and they would not impede flood flows. Accordingly, the disposal within the flood plain (Ysidora Flats) would be consistent with Executive Order 11988. This consistency with Executive Order 11988 has been added to Section 4.1.3 of the FSEIS.
3	1	The DSEIS states that a total of 35 archaeological sites and 5 isolated finds have been recorded within one mile of the study areas (Draft SEIS, 3.2.3). Some of the sites exist along the pipeline corridor from STP 13 to Ysidora Flats. In 4.2, Cultural Resources, Alternatives 1,2, and 4 do not indicate findings or identify cultural resources within the study area for each alternative; and each further states that there would be no significant impacts nor provides mitigation measures. Alternative 3 acknowledges a possibility of disturbance to cultural resources along the projected pipeline corridor and provides mitigation measures. Alternative 5 also states the possibility of buried cultural resources and includes mitigation similar to Alternative 3. In light of recent inadvertent discoveries at Camp Pendleton of significant cultural resources and human remains, the Pechanga Band requests that all project alternatives include: 1) a historic properties treatment plan prepared and submitted to SHPO; 2) preconstruction testing of known sites; 3) treatment of sites eligible for the National Register of Historic Places; 4) a construction monitoring plan be submitted to SHPO; 5) the monitoring plan will include archaeological and Native American monitors; 6) testing and treatment of newly discovered sites; 7) a program for dealing with inadvertent discoveries which is governed by NAGPRA.	A Historic Properties Treatment Plan (HPTP) has been prepared and covers all recorded sites and all concerns stated in this comment.

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3	2	The Pechanga Band wishes to be included in all monitoring and mitigation planning fpr the duration of the project.	The Pechanga Band will be included in all monitoring and mitigation planning as stated in the HPTP prepared for this proposed project.
4	1	The alternatives do not adequately address USFWS concerns regarding the elimination of sewage effluent from STP 3 which could lower groundwater levels in the Santa Margarita River by 5 feet or more during extended drought conditions.	See the response to comment 2-3 relating to the potential offset of the loss of effluent discharge from STP 3. See the response to comment 2-28 relating to the potential impacts of the elimination of effluent discharge from STPs 1, 3 and 8.
4	2	Although a number of the alternatives include discharge into the Santa Margarita River, we are concerned that the level of treatment would result in significant impacts to the Ysidora Flats mitigation site and inadequate effluent treatment would contribute to the degradation of the estuary, particularly during periods of river mouth closure.	See response to comments 2-3, 2-6, 2-7, 2-10, 2-11, 2-12, and 2-25, above with regard to surface discharges at Ysidora Flats. See response to comments 2-4 and 2-13 regarding potential impacts to estuary from disposal of effluent to groundwater at Lemon Grove.
4	3	In recognition of the ecological benefits from compliance with the Basin Plan's water quality standards and the adverse impacts from removing the effluent from the riverine system, sewage should be tertiary treated, including the removal of phosphorous and nitrogen to basin level standards and the treated effluent used to recharge the river basin to support riparian vegetation.	See response to comment 2-3. MCB Camp Pendleton recognizes the value of developing long term improvements to address water quality and quantity issues. Accordingly, MCB Camp Pendleton intends to submit a request to Congress for funding of tertiary treatment, and nutrient removal as necessary, of all effluent on the base. There is insufficient available funding in the current MCON project to implement tertiary treatment and nutrient removal.
4	4	The DSEIS should clarify whether the RWQCB would grant an extension from the May 1999 deadline for compliance with their Cease and Desist Orders, in order to obtain adequate funding and develop an alternative that addresses water quality and riparian habitat maintenance.	A minimum of 5 years is required before additional funding could be approved by Congress to permit tertiary treatment and nutrient removal. It is unlikely that the RWQCB would extend the Cease and Desist Order deadline to accommodate this period necessary to obtain additional congressional funding and implement such a project.
4	5	Information from the Pilot Test Basin study at the Lemon Grove ponds is needed to develop appropriate project alternatives, assist in assessing potential project impacts, and determining the least environmentally damaging practicable alternative.	See response to comment 2-4, above. Alternative 2 is the least environmentally damaging practicable alternative that can be implemented with the current congressionally-approved funding for this MCON project and comply with the Cease and Desist Order deadline.
4	6	We are concerned that the use of the Lemon Grove percolation ponds may result in the conversion of salt marsh habitats from an influx of fresh water that could alter salinity and species composition. The FSEIS needs to adequately address this issue and identify appropriate mitigation to ensure no net loss of salt marsh habitat.	See response to comment 2-4, above. The salt water marsh will benefit from cessation of effluent discharge from STP 13. Monitoring of the salt water marsh would be conducted by the Base as stated in comment 2-4 and included in Section 4.1 of the FSEIS.

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4	7	We are concerned that the minimally treated discharge [at Ysidora Flats] will impede the success of the restoration per the criteria in the Wetland Mitigation Plan for the BRAC project and recommend that other locations be evaluated as potential discharge points, effluent discharges be consistent with the Basin Plan water quality standards, and any discharges not interfere with the success criteria identified in the BRAC mitigation plan.	See response to comment 2-3, above. The goal of the proposed discharge at Ysidora Flats is to meet the success criteria for hydrology and woody species recruitment as contained in the BRAC Wetlands Mitigation Project report. In the event that the results of the monitoring program demonstrate that these success criteria cannot be met in the Ysidora Flats area, other areas would be considered.
5	1	The SD County Archaeological Society concurs in the impact analyses and mitigation recommendations.	Comment noted.

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DEPARTMENT OF COMMUNITY AND CULTURAL RESOURCES

COUNTY OF SAN BERNARDINO
PUBLIC SERVICES GROUP

SAN BERNARDINO COUNTY MUSEUM
2024 Orange Tree Lane • Redlands, CA 92374 • (909) 798-8570
Fax (909) 798-8585

September 15, 1998

Document No. 1

Department of the Navy
Naval Facilities Engineering Command
1220 Pacific Highway
San Diego, CA 92132-5190

Attention: Ms. Vicky Taylor, Code 533,.VT

Subject: Draft Supplemental EIR Statement, Sewage Effluent Compliance Project, Lower Santa Margarita Basin, Marine Corps Base, Camp Pendleton, San Diego, CA

Gentlemen:

The EIS fails to consider non-renewable paleontological resources. The project is located on Eocene, Miocene and Pleistocene sediments known to contain significant non-renewable paleontological resources.

The project proponent must retain a qualified vertebrate paleontologist to develop a paleontological resources impact mitigation program. This program must conform to the guidelines of the Society of Vertebrate Paleontologists. This program must include but not be limited to:

1. Conduct a pre-construction field assessment to locate fossils at surface exposures. Salvage of fossils from known localities, including processing standard sample of matrix for recovery of small vertebrates, and trackway replication. 1-1

2. Monitoring of excavation in areas likely to contain paleontologic resources by a qualified vertebrate paleontologic monitor. The monitor should be equipped to salvage fossils as they are unearthed to avoid

construction delays and to remove samples of sediments which are likely to contain the remains of small fossil vertebrates. The monitor must be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens.

3. Preparation of recovered specimens to a point of identification, including washing of sediments to recover small fossil vertebrates. 1-1

4. Identification and curation of specimens into a museum repository with retrievable storage.

5. Preparation of a report of findings with an appended, itemized inventory of specimens. The report and inventory, when submitted to the appropriate lead agency, signifies the completion of the program to mitigate impacts to paleontologic resources.

Sincerely,

Robert E. Reynolds /pm

Robert E. Reynolds
Curator, Earth Sciences

RER:ma

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

OCT 22 1998

Document No. 2

Southwest Division, Naval Facilities Engineering Command
Attn.: Ms. Vicky Taylor, Code 533.VT
1220 Pacific Hwy.
San Diego, CA 92132

Dear Ms. Taylor:

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Supplemental Environmental Impact Statement (DSEIS) for **Sewage Effluent Compliance Project, Lower Santa Margarita Basin, Marine Corps Base Pendelton, San Diego County, California**. Our comments are provided pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's NEPA Implementation Regulations at 40 CFR 1500-1508, and Section 309 of the Clean Air Act.

The DSEIS evaluates the environmental effects of alternative methods of sewage effluent disposal to those described in the Final Environmental Impact Statement/Environmental Impact Report (FEIS/R). The proposed alternatives in the FEIS/R described effects of effluent or brine discharge through an ocean outfall; however, the City of Oceanside did not approve the use of its ocean outfall during final consideration of the proposed action. The DSEIS evaluates management alternatives for land or surface disposal of sewage effluent, not previously developed in the FESI/R.

The Naval Facilities Engineering Command, Southwest Division (NAVY) evaluates five action alternatives and a no-action alternative in the DSEIS. All alternatives assume completion of construction of the pipelines and pump stations required to convey the secondary effluent from Sewage Treatment Plants (STPs) 1,2,3, and 13 to the 22-acre Lemon Grove Ponds, as described in the FEIS/R, approved in the Record of Decision (ROD), and under construction in 1998. The alternatives analyzed in the DSEIS respond to Navy's purpose and need of complying with Cease and Desist Orders and National Pollution Discharge Elimination System (NPDES) Permit (Order No., 94-51) issued by the San Diego Regional Water Quality Control Board (RWQCB), meeting other statutory and regulatory requirements, and consistency with Base mission requirements.

Alternative 1 would provide facilities for percolation of the total volume of effluent through construction of vertical drains at the Lemon Grove ponds. Alternative 2, Navy's preferred alternative, would include construction and effluent disposal elements of the first alternative, but adds a second phase whereby portions (some effluent would go to a golf course) of advanced secondarily treated wastewater from STPs 1 and 2 would be piped to the Ysidora Flats area of the Santa Margarita River for surface disposal, rather than conveyed to the Lemon Grove ponds. This alternative proposes an advanced treatment facility at STP 2. Alternative 3 is a "blending" alternative and proposes tertiary treatment facility construction at STP 13 and pumping of the treated effluent to Ysidora Flats. Effluent

from the remaining STPs, not used for golf course irrigation, would be blended with STP 13 effluent and then surface discharged at Ysidora Flats. Alternative 4 proposes piping all effluent to STP 13 for advanced secondary treatment. Disposal would be through the Lemon Grove percolation ponds, without vertical drains, in combination with 11 cased gravity injection wells. Alternative 5 is similar to alternative 4 but proposes that up to one-third of the tertiary treated effluent be applied to nearby agricultural fields, which are currently irrigated with potable water.

We have rated this DSEIS EO-2 -- Environmental Objections-Insufficient Information. (See the enclosed "Summary of Rating Definitions and Follow-up Action"). This rating reflects our objections over potential adverse impacts to waters of the U.S. and Special Aquatic Sites. According to our agency's internal Policy and Procedures for the Review of Federal Actions Impacting the Environment, an EO rating is appropriate where an action might violate or be inconsistent with achievement or maintenance of a national standard, or where there is potential for significant environmental degradation that could be corrected by project modification or other feasible alternatives. Based on the information provided, we are very concerned that environmental degradation and/or violation of Clean Water Act (CWA) standards could occur from ground water recharge at Lemon Grove ponds and from surface discharge at Ysidora Flats. The DSEIS is insufficient in providing information that would assure EPA that the proposed activities would not create significant adverse impacts. 2-1 EPA is pleased to note that the DSEIS reflects more optimal use of the area's valuable water resources than proposed in the FEIS/R, and we look forward to working with the Navy and other agency stakeholders to minimize potential adverse environmental effects from sewage disposal, while meeting Navy's purpose and need goals in the most timely manner possible. 2-2

We appreciate the opportunity to review this DSEIS and request meeting with you, the U.S. Fish and Wildlife Service (USFWS) and the San Diego Regional Water Quality Control Board (RWQCB) to discuss our objections, and review information. We request that two copies of the Final Supplemental EIS be sent to this office, attention David Farrel, at the letterhead address (mail code CMD-2) when it is officially filed with our Washington, D.C., office. For any questions, and to set up a meeting, please contact me at (415) 744-1566, or David Farrel (Federal Activities Office Chief) at (415)744-1584.

Sincerely,

Deanna M. Wieman, Deputy Director
Cross-Media Division

002801/98-251
Enclosures
cc: Doreen Stadtlander, U.S. Fish and Wildlife Service, Carlsbad
Greig Peters, RWQCB, San Diego
Eric Stein, U.S. Army Corps of Engineers, Los Angeles

SUMMARY OF RATING DEFINITIONS AND FOLLOW-UP ACTION

Environmental Impact of the Action

LO-Lack of Objections

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC-Environmental Concerns

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO-Environmental Objections

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU-Environmentally Unsatisfactory

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of environmental quality, public health or welfare. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommend for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact Statement

Category 1-Adequate

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2-Insufficient Information

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3-Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From: EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

WATER AND WATER-RELATED RESOURCES

Introduction

EPA's objections to the proposed project are founded on two issues that concern potential adverse impacts to waters of the U.S. and Special Aquatic Sites. These are (1) discharge of effluent at the Ysidora Flats area, and (2) direct and indirect impacts to the coastal and estuary environment from the percolation of effluent at the proposed Lemon Grove ponds. The issue of effluent discharge at Ysidora Flats concerns potential disturbance of the designated wetlands mitigation area, and potential impacts to designated functions and values. Our objections to the Lemon Grove operations are based on concerns that the chemical composition of groundwater-recharged sewage effluent could adversely affect the coastal estuary environment. Furthermore, there is insufficient information in the Draft Supplemental EIS (DSEIS) to predict direct, indirect, and cumulative impacts from the groundwater recharge. Our objections could potentially be alleviated by providing additional information in the Final Supplemental EIS (FSEIS), as requested in the comments that follow. We strongly recommend that the Navy, working together with the EPA and other permitting and regulatory agencies, determine if adverse environmental impacts could be avoided, and benefits gained, by project modification or other feasible alternatives-- with those determinations presented in the FSEIS. EPA would like to work with the Navy and the San Diego Regional Water Quality Control Board (RWQCB) to fully explore the potential flexibility of the May 1999 Cease and Desist Order deadline, in the context of ensuring the most environmentally beneficial, long term, sewage effluent disposal project. 2-3 2-4 2-5

Discharge at Ysidora Flats

Alternative 2, Navy's preferred alternative, and Alternative 3 both involve discharge of variously treated effluent at Ysidora Flats. EPA recognizes the value in maintaining groundwater recharge and surface flows within the middle and upper portions of the Santa Margarita Basin, and that potential adverse environmental effects could occur from complete elimination of current effluent discharge from STP 3, within this portion of the basin. We concur with the U.S. Fish and Wildlife Service's (USFWS's) scoping comment letter which described the potential for groundwater lowering, which may result in the degradation and/or loss of downstream wetland habitats especially during extended periods of drought. The USFWS recommended that Navy consider use of tertiary treated water to facilitate wetland establishment at the Ysidora Basin mitigation site. Our current objections stem from potential for the added effluent surplus to have an impact on the recruited riparian vegetation within the mitigation area. As the DSEIS states, the added water could create freshwater marsh habitat in the mitigation area or convert recruited riparian habitat into freshwater marsh. 2-3 Moreover, the benefits to the groundwater system are questionable 2-6

because, according to the DSEIS, the Ysidora Flats area has poor percolation capacity (pg. 3-47).
EPA recommends that the discharge of effluent, described in alternatives 2 and 3 as "groundwater 2-6
recharge," should be relabelled in the FSEIS as surface discharge with potential for some
groundwater recharge.

EPA understands that the Ysidora wetlands mitigation site was intended for establishment of a
riparian wetlands ecosystem. Any modification of that system through excess effluent discharge
or nutrient loading could alter the functions and values of these Waters and the intent of the 2-3
mitigation plan. This is clearly acknowledged by Navy in the DSEIS. In our comment letter on
the Draft EIS, dated February 3, 1997, we specifically stated that the Navy "...should not include
Ysidora Flats as a component of the effluent disposal system." Navy's proposed mitigation,
described on pages 4-24 and 4-25 of the DSEIS (essentially mitigation for a mitigation area) relies
heavily on monitoring. Monitoring should not be confused with mitigation. Monitoring is a set of
procedures that allows agencies to assure that their decisions are carried out, and is used to 2-7
ensure, essentially measure, that proposed mitigation is effective (40 CFR 1505.2, and 1505.3).
As stated in 40 CFR 1508.20, the order of preference for mitigation should be: avoid, minimize,
rectify, reduce and compensate. According to the DSEIS, increasing the nutrients on the site
could shift the competitive balance from native species to non-native species--and the advanced 2-3
secondary treatment of effluent per the preferred alternative (2) would not eliminate nutrients.
While Basin Plan water quality objective threshold and discharge to a standing water body values 2-8
for nitrogen and phosphorous are listed in the DSEIS, we recommend that estimated nitrogen and
phosphorous values for treated effluent are likewise provided in the FSEIS. We also recommend
that the Navy explain how the effluent nutrient levels would meet the requirements and standards 2-9
for a National Pollution Discharge Elimination System (NPDES) permit under the Clean Water
Act (CWA).

We recommend that the Navy reexamine its options and proposal for discharge of effluent at
Ysidora Flats. This should be accomplished through accurate scientific analysis (40 CFR 1501(b) 2-10
and 1502.24) that would provide the necessary information to, if need be, modify the proposed
discharge plan to either avoid impacts to the mitigation area altogether, or minimize such
impacts, <u>prior</u> to construction, rather than as possible remediation at a later time. The document
is insufficient in presentation of hydrogeolgic information. Without additional information we can
only speculate that if groundwater recharge is deemed a worthy goal at Ysidora flats, and surface 2-11
percolation rates are low, then a partial solution to the problem may be through the construction
of injection wells, perhaps in combination with surface discharge during drought years. We
encourage the Navy to pursue this option, or state in the FSEIS why this is not feasible. Navy
should not speculate or rely on monitoring to gage impacts of nutrient loading, or flooding, on the 2-12
area. Rather, we recommend that the FSEIS include additional analyses of expected impacts from

nutrient loading and flooding, based on literature review, and if necessary, additional modeling. In conclusion, EPA understands the benefit to recharge the groundwater basin and to protect the riparian wetlands mitigation project during low water events. We would like to work with the Navy in modifying the preferred alternative to achieve a more up-front level of confidence that applied water would not modify or degrade the riparian system, while still allowing groundwater recharge and supplemental water to the wetlands during droughts. 2-12

Discharge at Lemon Grove Ponds

Alternatives 1, 2, 4, and 5 all rely, to some extent, on discharge of effluent to groundwater through various proposed combinations of effluent treatment and groundwater recharge mechanisms at the Lemon Grove ponds. We recognize the threat of salt water intrusion as groundwater resources up-basin are utilized; and for this reason, using at least a portion of the system effluent for groundwater recharge within the lower Santa Margarita Basin makes sense. Our objections to the proposal, at this time, are based on insufficient information in the DSEIS, to assure that the effluent could not enter the nearby salt marsh, a Special Aquatic Site, and cause adverse and significant impacts to the estuary ecosystem. The DSEIS states (pg. 2-13) that the final field study findings would be based upon the pilot field study and modeling described in Section 2.1.3. Currently, there is incomplete information in the DSEIS to assure that adverse 2-13

impacts could not occur, nor is there any substantial scientific information in the document to weigh the merits of various recharge and irrigation options with respect to efficiency of the proposal in stopping salt water intrusion or other water resource related benefits. Environmental Impact Statements "...shall be supported by evidence that the agency has made the necessary environmental analyses." (40 CFR 1502.1). Moreover, in order to make a reasoned choice among alternatives, an agency should include additional information, assuming overall costs are not exorbitant (40 CFR 1502.22). 2-14

We recommend that appropriate groundwater modeling results and studies of potential effects of nutrient loading and fresh-water flooding of the coastal salt marsh be completed and presented in 2-15

the FSEIS. A better understanding of the hydrogeology, percolation rates, hydraulic conductivities, etc., is necessary for a reasoned choice among alternatives. For example, based on the currently presented information, it is not clear what are the advantages and disadvantages of the vertical drains (alternative 2), versus, an injection well system, with or without agricultural irrigation (alternatives 4 and 5). 2-16

In the event that either alternatives 1,2,4 or 5 are adopted, EPA requests that the "centroid" latitude/longitude location of the vertical drain field (technically the vertical drains are class V injection wells), or the deeper injection wells, be provided to us for an ongoing Class V injection 2-17

well inventory project, under the Underground Injection Control (UIC) program. This information should be sent to Laura Bose, WTR-9, at the letterhead address. 2-1

Miscellaneous Water-Related Comments

Figure 2-6, Alternative 1, Generalized Cross Section Schematic, appears misleading. Understandably, this is a generalized, conceptual, drawing; however, the text in the DSEIS states that one of the objectives of the trench would be to prevent lateral flow into the adjacent salt marsh. 2-1 Yet, the drawing suggests that effluent would continue to flow into the marsh. The cross section could be much improved by using or obtaining real data and subsequently showing projected fluid flow paths.

Figures 2-12 and 2-13, Schematic Flow Diagrams, respectively for alternatives 4 and 5, do not show dechlorination prior to groundwater injection. 2-1 The FSEIS should indicate if this step would be included in either alternative.

Figure 2-8, Alternative 2, Location of Phase 2 facilities. The figure and accompanying text do not clarify whether the pipeline between STP 2 and the proposed Ysidora discharge point is already 2-2 constructed, authorized in the FEIS/R ROD, or is a new proposal. The FSEIS should clarify this point.

Table 2-3 states that percolation of secondary effluent at the Lemon Grove site would exceed Basin Plan requirements for Total Dissolved Solids (TDS) for the Lower Ysidora Basin, but would be permittable since the site is at the boundary of the basin and the underlying groundwater is saline. 2-2 On page 4-3, the Navy provides the "postulated" existing groundwater quality in vicinity of Lemon Grove. In the FSEIS, Navy should provide the information on which it basis its "postulation." Furthermore, because the groundwater is very shallow in vicinity of the Lemon Grove area, EPA does not believe that the costs of obtaining accurate salinity data would be exorbitant. Currently, there is incomplete information in the DSEIS to indicate whether there is any stratification of the TDS in the groundwater. For example, if there is a freshwater lens (classified as an Underground Source of Drinking Water, or USDW), above non-potable water, 2-2 then a series of deeper injection wells may be environmentally more sound than a shallow percolation facility. The FSEIS should clarify this situation and answer the posed questions.

Pg. 3-5 discusses the existing discharges in the project area, yet there is no accompanying figure to illustrate the text. EPA strongly recommends that the Navy include one accurate and comprehensive figure showing existing surface discharge points and the proposed discharge point 2-23 at Ysidora Flat. The scale of Figure 2-1 would be appropriate. The new figure should include the

location of the STP's and the existing pipelines, those pipelines authorized in the FEIS/R ROD, and new proposed pipelines. 2-23

Pg. 3-48. Navy should describe and/or acknowledge the consistency of the various proposed recharge/discharge alternatives with the Federal Consistency implementory regulations of the Coastal Zone Management Act. 2-24

NEPA ISSUES

EPA is very concerned that the Navy relies on the implementation of various monitoring programs and a reactive plan of potential mitigation remedies, if and when certain adverse impacts occur from the proposed action. For example, on page 4-8, the DSEIS states that "mitigation of impacts to a level less than significant would be through implementation of an approved and permitted monitoring program." As we have indicated in the water resources section of our comments, mitigation should strive for avoiding an impact altogether or minimizing impacts up-front. Again, while monitoring is a first step in identifying problems, it should not be considered as mitigation. 2-25 An EIS should include sufficient documentation to enable readers and decision makers to understand exactly what the Navy intends to physically do to mitigate impacts identified from the monitoring that would occur. Elsewhere in the document you indicate that design, planning and monitoring would be in accordance with approvals and permits from the cognizant resource agencies. Because the EIS is a public document, stating that impacts would be less than significant because an appropriate agency would provide a permit and subsequent monitoring, does not provide the level of information or access to that information, that the public should be entitled to. As per 40 CFR 1502.1, an EIS is both a public disclosure document, a planning document, and a decision making document. Wherever possible, and if reasonably feasible, the Navy should strive for additional information to bolster the scientific integrity of its FSEIS, in order to make the best project alternative decisions and optimize up-front project management and planning.

CUMULATIVE IMPACTS

The cumulative impacts section of the document fails to mention that Camp Pendleton is included in EPA's Superfund National Priorities List (NPL). Under the cumulative impacts section, Navy should provide a brief summary of the nature of the Superfund activity and the affected environment. Furthermore, since some of the Superfund sites are groundwater contaminant plumes, the Navy should describe in the FSEIS how the proposed groundwater recharge activities would affect the existing groundwater contamination. 2-26 We also ask that you provide references to the completed EIS's on the previously completed sewage effluent projects at San Onofre and Las 2-27

Pulgas, and discuss the success/failure of any implemented groundwater recharge projects as they may relate to the currently proposed activities. 2-27

The Navy states that the proposed action would result in the reduction by approximately 2 MGD of the amount of water recharge to the downstream portions of MCB Camp Pendleton's groundwater basins, but would be offset by a recently initiated up-basin recharge program--and thus "would not contribute to cumulative significant impacts to water quality or quantity." This statement does not appear to have much scientific basis. No information is given in the DSEIS as to how much of the 2 MGD, currently being discharged into the Santa Margarita River, actually ends up in the groundwater. Furthermore, even if quantities of groundwater recharge are the same in both parts of the basin, this does not necessarily imply that there would be no cumulative significant impacts from the proposed action. In the FSEIS, Navy should further elaborate on the groundwater balance of the proposed and ongoing recharge projects and relate this to the potential to create adverse impacts, and also compare the net recharge (including proposals at Ysidora Flat) to currently projected basin safe yield. 2-28

MISCELLANEOUS COMMENTS

Under the Geology and Soils section of the FSEIS the Navy should discuss whether the proposed groundwater recharge operation at Lemon Grove could cause or create the potential for slope failures, or induce seismic events, at the site or along the adjacent coastline. 2-29

Navy notes that the proposed Ysidora discharge site is within the 100-year flood plain. The placement of this facility within the flood plain would appear to be inconsistent with Executive Order 11988, Floodplain Management. In the FSEIS, the Navy should explain why the discharge facility would have to be located in the floodplain, and how this would be consistent with the Executive Order, particularly in view of the proposed discharge structure or multiple discharge points as described on page 2-18. 2-30

CALIFORNIA INDIAN LEGAL SERVICES

120 WEST GRAND AVENUE, SUITE 204
ESCONDIDO, CALIFORNIA 92025
(760) 746-8941 TELECOPIER (760) 746-1815

DIRECTING ATTORNEY
LISA C. OSHIRO
STAFF ATTORNEYS
LAWRENCE R. STIDHAM
DENISE M. DOUGLAS
CHARMAINE L. HUNTTING-CORONEL
JOSEPHANIE R. ACKMAN
LEGAL FELLOW
JOANNE WILLIS NEWTON

Document No. 3

October 26, 1998

Southwest Division
Naval Facilities Engineering Command
Attn: Ms. Vicky Taylor, Code 533. VT
1220 Pacific Highway
San Diego, CA 92132-5190
Fax: (619)532-2381

Re: Draft Supplemental Environmental Impact Statement (SEIS)
Sewage Effluent Compliance Project, Lower Santa Margarita Basin
Marine Corps Base, Camp Pendleton, San Diego County, California

Dear Ms. Taylor:

This letter is to comment on the Draft Supplemental Environmental Impact Statement (SEIS), Sewage Effluent Compliance Project, Lower Santa Margarita Basin which will commence on the Marine Corps Base, Camp Pendleton, San Diego County, California.

As is stated in 3.2.2 Ethnohistoric Period of the Draft SEIS, the Camp Pendleton area was and is within the territory of a cultural group called the Luiseno. The Pechanga Band of Luiseno Mission Indians, sometimes known as the "Pechanga Band", is descended from those Luisenos within whose territory Camp Pendleton was and is located. The Pechanga Band, as lineal descendants of the effected territory, requests additional mitigation measures with regard to cultural resources that will be impacted by this project.

The Pechanga Band is not opposed to this project. The Pechanga Band's primary concerns stem from the project's impacts on Native American cultural resources. The Pechanga Band is concerned about both the protection of unique and irreplaceable cultural resources, such as Luiseno village sites and archaeological artifacts which would be displaced by ground-disturbing work on the project, and on the proper and lawful treatment of artifacts, Native American human remains and sacred items likely to be discovered in the course of the work.

A search of recorded sites within the project impact area revealed that a total of 35 archaeological sites and five isolated finds have been recorded within one mile of the study areas (Draft SEIS, 3.2.3). Most of the areas are located within the Stuart Mesa and other terraces surrounding the Santa Margarita River, and most consist of scatters of prehistoric and historic artifacts and shell (Ibid.). Moreover, none of the sites are recorded within the Lemon Grove pond 3-1

area, the AWT plant site, the discharge area at Ysidora Flats or STP 2 (Ibid.). However, some of the sites exist along the pipeline corridor from STP 13 to Ysidora Flats. These sites were identified during the cultural resources evaluation for the FEIS/R. During the installation of the pipeline corridor, significant cultural resources were identified through the use of a monitoring program and mitigation measures were implemented.

In 4.2 Cultural Resources, neither Alternative 1, Alternative 2 (the preferred Alternative), nor Alternative 4 indicate findings or identifies cultural resources within the study area for each Alternative. Each Alternative further states that there would be no significant impacts (to cultural resources) and neither provides for the requirement of mitigation measures.

Alternative 3 acknowledges a possibility of disturbance to cultural resources along the projected pipeline corridor. Alternative 3 states that the installation of said pipeline "would result in potential significant impacts to cultural resources". In consideration of this, Alternative 3 provides for mitigation measures which include a historic properties treatment plan prepared and submitted to SHPO, preconstruction testing of known archaeological sites, treatment of sites eligible for the National Register of Historic Places, a construction monitoring program, Native American involvement, treatment of newly discovered sites, and a program for inadvertant discoveries under NAGPRA.

Alternative 5 also provides for the possibility for the "occurrence of buried cultural resources. The mitigation measures for Alternative 5 are similar to the measures in Alternative 3, and they include a construction monitoring program, Native American involvement, a program for inadvertent discoveries under NAGPRA, and testing of any newly discovered sites.

In light of recent inadvertent discoveries at Camp Pendleton of significant cultural resources and human remains, and thus the greater potential that Native American cultural resources will be impacted by the project, the Pechanga Band requests the following mitigation measures be in effect for **any** Alternative Project Plan chosen (except for Alternative 6) for this project:

1. A historic properties treatment plan prepared and submitted to SHPO.
2. Preconstruction testing of known archaeological sites.
3. Treatment of sites eligible for the National Register of Historic Places.
4. A construction monitoring plan be devised and submitted to SHPO.
5. The monitoring plan will include archaeological and Native American monitors.
6. Testing and treatment of newly discovered sites.
7. A program for dealing with inadvertent discoveries which is governed by NAGPRA.

The Pechanga Band wishes to be included in all monitoring and mitigation planning for the duration of the project. As a federally-recognized Indian tribe with an active tribal Cultural Resources Committee, and as a Luiseno tribe with a direct interest and role in the project, the Pechanga Band requests to actively participate in the monitoring and mitigation plan which will accompany the project. 3-

The Pechanga Band also requests the opportunity to view and make claims to the prehistoric and historic artifacts which were recovered from the "35 archaeological sites and 5 isolated finds" in and around Stuart Mesa and other terraces surrounding the Santa Margarita River. These finds were discovered as part of the evaluation of cultural resources for the FEIS/R.

Please include the Pechanga Band and California Indian Legal Services on your mailing list for this and other projects which will impact Luiseno sites.

Pechanga Indian Reservation
attn: Pechanga Cultural Resources Committee
P.O. Box 1477
Temecula, CA 92593

John A. Gomez
California Indian Legal Services
120 W. Grand Ave., Ste. 204
Escondido, CA 92025

Thank you for your time and for listening to the Pechanga Band's requests and comments in regards to the above project. The Band looks forward to working with your agency and other interested agencies in protecting the invaluable Native American cultural resources found on and within Marine Corps Base Camp Pendleton.

Sincerely,

John Gomez
Paralegal

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
600 Harrison Street, Suite 515
San Francisco, California 94107-1376

Document No. 4

November 2, 1998

ER 98/0578

Commanding Officer, Department of Navy
Southwest Division, Naval Facilities Engineering Command
(ATTN: Ms. Vicky K. Taylor, Code 533.VT)
1220 Pacific Coast Highway
San Diego, California 92132-5190

Dear Commanding Officer:

The Department of the Interior (Department) has reviewed the Draft Supplemental Environmental Impact Statement (DSEIS) for the Sewage Effluent Compliance Project Lower Santa Margarita Basin, Marine Corps Base Camp Pendleton (MCBCP), San Diego County, California The following comments are provided for your use and information when preparing the Final Supplemental Environmental Impact Statement (FSEIS).

BACKGROUND

The Final Environmental Impact Statement (FEIS) for the subject project identified the La Salinas ocean outfall as the disposal method for effluent generated from MCBCP's Sewage Treatment Plants (STPs) 1,2,3,8, and 13. However, the City of Oceanside denied the Marine Corps' request to use the La Salina outfall. Consequently, the DSEIS was issued to evaluate alternatives for the final disposal of sewage effluent generated from the STPs. Construction of the Lemon Grove percolation ponds and pipelines was completed after issuance of the FEIS and its Record of Decision.

The DSEIS includes an analysis of five alternatives in addition to the no project alternative. The alternatives differ in the level of sewage effluent treatment, disposal location, and method of disposal. Phase I of Alternative 2, the preferred alternative, would convey the total effluent (4.4 MGD) generated from the five STPs to the Lemon Grove percolation ponds. Construction of vertical drains would be necessary to enhance the percolation capacity of the ponds. Phase II would add a system of advanced wastewater treatment (without nutrient removal) of effluent from STPs 1 and 2. Effluent from STPs 1 and 2 would be used for golf course irrigation with the unused portion discharged at the Ysidora Flats mitigation site located within the Santa Margarita River. The only alternative that identifies tertiary treatment of effluent as a project component is

Alternative 3 which would require construction of a tertiary treatment facility at STP 13. Tertiary treated effluent from STP 13 would be pumped to the Ysidora Flats and combined with the remaining secondary treated effluent from STPs 1 and 2, after irrigation of the golf course, plus the secondary effluent from STPs 3 and 8. The blended effluent would be discharged at the Ysidora Flats mitigation site.

GENERAL COMMENTS

Alternatives Analysis The proposed alternatives do not adequately address the concerns the Department previously expressed regarding the elimination of sewage effluent from the Santa
Margarita River. As stated in the "Programmatic Groundwater/Riparian Habitat Assessment at 4
MCBCP (Groundwater Assessment)," the elimination of sewage effluent generated by STP 3 could lower groundwater levels by five feet or more during extended drought conditions, which may adversely affect riparian habitat. The Groundwater Assessment concludes that an approximate 80-acre area in the Chappo and Ysidora Subbasins would likely be affected by the removal of the effluent discharge. Although a number of the alternatives proposed in the DSEIS include discharge into the Santa Margarita River, we are concerned the level of treatment (i.e.,
secondary or tertiary blended with secondary) would result in significant impacts to the Ysidora 4
Mitigation site and that inadequate effluent treatment would contribute to the degradation of the estuary, particularly during extended periods of closure of the river's mouth.

Recognizing the ecological benefits from compliance with the water quality standards identified in
the basin plan, as well as the potential adverse impacts from removing the effluent from the 4
riverine system, sewage effluent should be tertiary treated, including the removal of phosphorous and nitrogen to basin level standards, and the treated effluent be used to recharge the Santa Margarita River basin to support riparian vegetation. Although the DSEIS states that compliance with the Regional Water Quality Control Board Cease and Desist Orders is required by the May 1999 deadline, the FSEIS should clarify whether the RWQCB would grant an extension of the
compliance deadline to obtain adequate funding, and the development of an alternative that 4
addresses water quality and riparian habitat maintenance. The FSEIS should recommend a meeting be held among the Marine Corps, Fish and Wildlife Service, Environmental Protection Agency, and interested parties to discuss this issue.

According to the DSEIS, a Pilot Test Basin field study would be conducted in the summer of 1999 to provide data for groundwater modeling studies and refine estimates of the percolation capacity of the Lemon Grove ponds and proposed vertical drains. The study would also address the potential for lateral groundwater seepage of effluent to surface areas at the river bluff face.
Data would be obtained to predict future water quality and water table elevations for the 4
proposed alternatives. In addition, the model would define the influence and boundary of discharge into the basin, and address potential effects of nutrients on adjacent ocean water quality. Information from this study is needed to develop appropriate project alternatives and assist in

assessing potential project impacts. The findings of this study should be incorporated into the process for determining the least environmentally damaging practicable alternative. 4-5

Impacts of the Proposed Action We are concerned that the use of the Lemon Grove percolation ponds may result in the conversion of salt marsh habitats. As stated in the DSEIS, an influx of fresh water could alter salinity and species composition. Impacts to salt marsh habitat would be considered significant given that San Diego County has already lost over 87 percent of this habitat type. The FSEIS needs to adequately address this issue and identify appropriate mitigation measures to ensure a no net loss of salt marsh habitat. 4-6

Although the DSEIS includes a proposal to monitor the effects of effluent discharge at the Ysidora mitigation site, we are concerned that the minimally treated discharge will impede the success of the restoration as identified in the criteria established in the final Wetland Mitigation Plan for the Base Realignment and Closure (BRAC) project. We recommend that other locations be evaluated as potential discharge points, effluent discharges be consistent with the requirements of the basin plan for water quality standards, and any discharges not interfere with the success criteria identified in the BRAC mitigation plan. 4-7

Thank you for the opportunity to comment on this project..

Sincerely,

Patricia S Port

Patricia Sanderson Port
Regional Environmental Officer

cc:
Director, OEPC, w/original incoming
Regional Director, FWS, Portland

San Diego County Archaeological Society

Environmental Review Committee

19 October 1998

Document No. 5

To: Ms. Vicky Taylor
Code 533.VT
Southwest Division
Naval Facilities Engineering Command
1220 Pacific Highway
San Diego, California 92132-5190

Subject: Draft Supplemental Environmental Impact Statement
Sewage Effluent Compliance Project, Lower Santa Margarita Basin,
Marine Corps Base, Camp Pendleton

Dear Ms. Taylor:

I have reviewed the cultural resources aspects of the subject DSEIS on behalf of this committee of the San Diego County Archaeological Society.

Based on the information contained in the document, we concur in the impact analyses and mitigation recommendations proposed for cultural resources.] 5-1

Thank you for including SDCAS in the public review of this project's environmental impacts.

Sincerely,

James W. Royle, Jr.

James W. Royle, Jr., Chairperson
Environmental Review Committee

cc: SDCAS President
file

P.O. Box 81106 . San Diego, CA 92138-1106 . (619) 538-0935

CHAPTER 9.0
REFERENCES AND INDIVIDUALS AND AGENCIES CONSULTED

9.0 REFERENCES, INDIVIDUALS AND AGENCIES CONSULTED

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CHAPTER 10.0
LIST OF ABBREVIATIONS AND ACRONYMS

10.0 LIST OF ACRONYMS AND ABBREVIATIONS

AAM	Annual Arithmetic Mean
AC/S ES	Assistant Chief of Staff, Environmental Security
AGM	Annual Geometric Mean
APCD	Air Pollution Control District
AWT	Advanced Water Treatment
BA	Biological Assessment
Basin Plan	Water Quality Control Plan for the San Diego Basin
BAT	Best Available Technology
BMP	Best Management Practices
BO	Biological Opinion
BOD	Biochemical Oxygen Demand
BRAC	Base Realignment and Closure
CDFG	California Department of Fish and Game
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Data Base
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	Carbon Monoxide
CZMA	Coastal Zone Management Act
dB	Decibel
dBA or dB(A)	A-weighted decibels
DHS	State of California Department of Health Services
DNL or L_{dn}	Day-Night level
DO	dissolved oxygen
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FEIS/R	Final Environmental Impact Statement/Environmental Impact Report
ft	Feet/foot

GIS	Geographic Information System
GPS	Global Positioning System
HA	Ysidora Hydrologic Area
HSA	Lower Ysidora Hydrologic Subarea
I-15	Interstate 15
I-5	Interstate 5
L_{eq}	Equivalent noise level
lbs/day	Pounds per day
MCB	Marine Corps Base
MCO	Marine Corps Order
MCON	Military construction
MCTSSA	Marine Corps Tactical Systems Support Activity
MG	Million gallons
mg/L	Milligrams per liter
MGD	million gallons per day
MPN	Most probable number
N/A	Not available
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
National Register	National Register of Historic Places
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NH_4	ammonia
NOI	Notice of Intent
NO_2	Nitrogen Dioxide
NO_3	Nitrate
NOx	Oxides of Nitrogen
NPDES	National Pollution Discharge Elimination System
NTU	Natural Turbidity Units
O_3	Ozone
OSHA	U.S. Occupational Safety and Health Administration

P	Phosphorus
$PM_{2.5}$	Fine particulate matter equal to or less than 2.5 microns in diameter
PM_{10}	Particulate matter equal to or less than 10 microns in diameter
PO_4	Phosphate
ppm	Parts per million
RHGA	Repeatable high ground acceleration
ROD	Record of Decision
ROI	Region of Influence
RONA	Record of Non-Applicability
RWQCB	San Diego Regional Water Quality Control Board
SAR	Sodium Adsorption Ratio
SCAQMD	South Coast Air Quality Management District
SCS	Soil Conservation Service
SDAB	San Diego Air Basin
SDG&E	San Diego Gas and Electric Company
SEIR	Supplemental Environmental Impact Report
SEIS	Supplemental Environmental Impact Statement
SHPO	California State Historic Preservation Office
SIP	State Implementation Plan
SO_2	Sulfur dioxide
SR	State Route
STP	Sewage Treatment Plant
SWDIV	Southwest Division, Naval Facilities Engineering Command
SWRCB	California State Water Resources Water Control Board

TDS	Total Dissolved Solids
TKN	Kjeldahl nitrogen
TP	total phosphorous
TUa	Acute Toxicity Units
TUc	Chronic Toxicity Units
USACOE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
$\mu g/m^3$	Micrograms per cubic meter
VOC	Volatile Organic Compounds

APPENDICES

APPENDIX A
NOTICE OF INTENT AND COMMENTS

DEPARTMENT OF THE NAVY
SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

11000
Ser 533.VT/093
11 Feb 1998

Ladies and Gentlemen:

The enclosed Notice of Intent (NOI) to prepare a Supplemental Environmental Impact Statement (EIS) for the Military Construction Project P-527B, Sewage Effluent Compliance, Lower Santa Margarita Basin, Marine Corps Base Camp Pendleton, California is provided for your information.

The NOI appeared in the Federal Register on February 4, 1998 with the public comment period ending on March 23, 1998.

For further information regarding this matter, please contact Ms. Vicky Taylor of this command, at (619) 532-3007. Please provide your comments regarding the scope of analysis of the Supplemental EIS or any issues of concern you would like addressed in the Supplemental EIS in writing to Ms. Taylor by March 23, 1998 at the following address:

Southwest Division, Naval Facilities Engineering Command
1220 Pacific Hwy
Attn: Ms. Vicky Taylor (Code 533.VT)
San Diego, CA 92132-5190
Fax: (619) 532-3789/3035

Sincerely,

Vicky K. Taylor

VICKY K. TAYLOR
By direction of
the Commanding Officer

Encl:
(1) NOI(1 copy)

Copy to: (w/encl)
Commanding General, Marine Corps Base, Camp Pendleton, Assistant Chief of Staff, Facilities, Attn: Mr. Ted Thomas, P. O. Box 555013, Camp Pendleton, CA 92055-5013
Commanding General, Marine Corps Base, Camp Pendleton, Assistant Chief of Staff, Environmental Security, Attn: Dr. Richard Kramer, BLDG 22165, P.O. Box 555008, Camp Pendleton, CA 92055-5008

DEPARTMENT OF DEFENSE
Department of the Navy

Notice of Intent to Prepare a Supplemental Environmental Impact Statement for Milcon Project P-527B, Sewage Effluent Compliance, at Marine Corps Base Camp Pendleton, California.

Pursuant to section 102(2)(C) of the National Environmental Policy Act (NEPA) of 1969 as implemented by the Council on Environmental Quality Regulations (40 CFR parts 1500-1508), the U.S. Marine Corps announces its intent to prepare a Supplemental Environmental Impact Statement (EIS) to evaluate the environmental effects of proposed alternative methods of sewage effluent disposal, in order to achieve compliance with a San Diego Regional Water Quality Control Board (RWQCB) Cease and Desist Order at Marine Corps Base (MCB), Camp Pendleton. The Sewage Effluent Compliance Project, Lower Santa Margarita Basin Environmental Impact Statement/Report (EIS/R), which this report will supplement, addressed a system of pumps and piping to deliver effluent from Sewage Treatment Plants 1, 2, 3, 8, and 13 to percolation ponds and an existing ocean outfall for discharge. Each of the three alternatives evaluated included an element of effluent or brine discharge through the ocean outfall. During final consideration of the proposed action, the City of Oceanside City Council disapproved use of its ocean outfall, thus requiring evaluation of further alternatives.

MCB Camp Pendleton is proceeding with on-base construction of the effluent collection and percolation pond elements of the disposal system described in the Final EIS/R and Record of Decision. This Supplemental EIS will analyze four alternatives to provide additional and sufficient disposal capacity, without the use of an ocean outfall, to achieve compliance with the San Diego RWQCB Cease and Desist Order.

The four alternatives include: Alternative 1, land disposal – percolation of all effluent; Alternative 2, land and live stream disposal – percolation with seasonal discharge; Alternative 3, land and live stream disposal – percolation, advanced treatment and live stream discharge; and Alternative 4, land disposal – percolation, advanced treatment and reclamation. All alternatives will require the construction of percolation ponds at up to three locations; Lemon Grove, I-5/Railroad site, and the Boat Basin site. Under Alternative 1, the effluent would be conveyed through underground piping between the three sites. Most of this piping would be installed in existing roadways.

Under Alternative 2, berm height and depth at Lemon Grove will be increased, and an effluent storage pond will be constructed at Stuart Mesa. These structures will accommodate effluent storage when effluent input to the percolation ponds exceeds the percolation rate, and live stream disposal is not feasible. The effluent will be discharged from the Lemon Grove and Stuart Mesa storage

ponds to the Santa Margarita River when the volume of river flow provides sufficient dilution of the effluent. The proposed discharge point will be north of the Lemon Grove ponds.

Alternative 3 will process effluent, that is in excess of the percolation rate, to remove nitrogen, phosphorous and other constituents, and will be discharged to the Santa Margarita River at the same point identified in Alternative 2. Construction of an advanced water treatment (AWT) facilities adjacent to Sewage Treatment Plant (STP) 13 and some effluent storage capacity will be required. Although the AWT would improve the quality of the effluent, it is not anticipated that the current Basin Plan objectives for total dissolved solids (TDS) would be achieved, and modification to the Basin Plan would be required.

Alternative 4 will be similar to Alternative 3, except the AWT effluent will be conveyed to a point near the existing irrigation system and used for irrigation of on-base, leased agricultural lands northwest of the Lemon Grove ponds, on the east and west sides of I-5.

In addition, an alternative for a more limited expansion of the Lemon Grove Ponds will be considered in the Supplemental EIS. This alternative would limit the size of the Lemon Grove pond expansion to avoid the removal of approximately 300 eucalyptus trees. This alternative may be combined with any of Alternatives 1-4.

A supplement to the previously issued EIR is not required since the revised proposed action does not require local approvals or California Environmental Quality Act certification.

The scope of the analyses and issues of concern for this Supplemental EIS are anticipated to be very similar to those addressed in the Final EIS/R. The major issues are expected to be hydrology and water quality, biological resources, and cultural resources. Other issues to be addressed include geology and soils, air quality, land use, transportation and circulation, noise, visual resources, safety and environmental health, utilities, socioeconomics, and environmental justice.

This notice has been mailed to all parties who commented on the Sewage Effluent Compliance Project, Lower Santa Margarita Basin Environmental Impact Statement/Report (EIS/R), and other interested parties. This Notice has also been published in local newspapers. The Marine Corps invites agencies, organizations, and the general public to provide written comments relative to the proposed project and the issues to be addressed in the Supplemental EIS. Scoping comments should clearly describe specific issues or topics which the commentor believes the Supplemental EIS should address.

Written statements or questions regarding the scoping process should be received no later than March 23, 1998, and should be sent to:

Southwest Division, Naval Facilities Engineering Command
1220 Pacific Highway
San Diego, CA 92132-5190
Attn: Ms. Vicky Taylor, Code 533.VT

Phone (619) 532-3007

Dated: January 30, 1998

L.L. Larson, Colonel, USMC
Acting Head, Land Use and Military Construction Branch
Facilities and Services Division
Installations and Logistics Department

By direction of the Commandant of the Marine Corps

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

February 27, 1998

Southwest Division, Naval Facilities Engineering Command
1220 Pacific Highway
San Diego, CA 92132-5190
Attn: Ms. Vicky Taylor, Code 533.VT

Dear Ms. Taylor:

The Environmental Protection Agency (EPA) has reviewed the Notice of Intent (NOI) to prepare a supplemental Environmental Impact Statement (EIS) for **Milcon Project P-527B, Sewage Effluent Compliance, at Marine Corps Base Camp Pendleton, California.** Our review is pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act (CAA). The EPA commented on the draft (February 1997) and final EIS (August 1997) that preceded this notice.

The supplemental EIS will evaluate the environmental effects of alternative methods of sewage effluent disposal to those described in the draft and final EIS (FEIS). The proposed alternatives in the FEIS described effects of effluent or brine discharge through an ocean outfall, however, the City of Oceanside did not approve the use of its ocean outfall during final consideration of the proposed action. The supplemental EIS would evaluate four management alternatives for effluent disposal that include: land disposal (percolation of all effluent), land and live stream disposal (percolation with seasonal discharge), land and live stream disposal with advanced treatment of live stream discharge, and land disposal with advanced treatment and reclamation of water for use in irrigation. Each alternative would require percolation pond construction at up to three locations.

The Marine Corps should consider withdrawing its April 1997 FEIS and reinitiating the EIS process with the NOI's four alternatives. A supplemental EIS would be appropriate if the Marine Corps were to make a substantial change in a proposed action that is relevant to environmental concerns, or if there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts (40 CFR Parts 1500-1508, Section 1502.9(c)). However, the methods by which the Marine Corps proposes to achieve sewage effluent compliance in the NOI (i.e., percolation ponds, live stream and irrigation discharges) are fundamentally altered from the FEIS (i.e., primarily ocean outfall), and appear to be more than a "substantial change in a proposed action." EPA is concerned that the alternatives described in the NOI are sufficiently different that comparisons of the proposed supplemental document to the FEIS would be confusing to the decisionmaker and the public.

The Marine Corps identifies several key environmental issues that warrant careful consideration in the supplemental EIS. We concur with the Marine Corps' approach in emphasizing hydrology, water quality, biological resources, and cultural resources. The additional analyses concerning geology and soils, air quality, land use, environmental justice, safety and environmental health, utilities, and others should also receive careful consideration.

EPA recommends that the EIS discuss the extent to which water quality and sensitive or unique habitats, if any, can be protected and improved through the project's implementation or its mitigations. Also, EPA is pleased to note that the alternatives described in the NOI reflect more optimal use of the area's valuable water resources that was reflected in the FEIS.

We appreciate the opportunity to review this NOI. Additional comments are enclosed. Please send two copies of the EIS to this office at the same time it is officially filed with our Washington D.C. Office. If you have any questions, please call me at (415) 744-1584, or Rosalyn Johnson of my staff at (415) 744-1574.

Sincerely,

David J. Farrel, Chief
Federal Activities Office

Attachment
2801supp.noi

COMMENTS

NEPA

1. EPA recommends that a new draft EIS be issued that provides clear descriptions of the basic project purpose and need, project alternatives, potential impacts to the environment, and mitigation for these impacts. The analysis should comparatively evaluate environmental impacts of the four alternatives, defining the issues and providing a clear basis for choice among options for the decisionmaker and the public (40 CFR 1502.14).

2. NEPA requires evaluation of reasonable alternatives not within the jurisdiction of the lead agency (40 CFR Section 1502.14(c)). Furthermore, there should be a clear discussion of the reasons for the elimination of alternatives which were not evaluated in detail.

3. The EIS should analyze potential cumulative effects in the Region of Influence (ROI). According to 40 CFR 1508.7, "(c)umulative impacts can result from individually minor but collectively significant actions taking place over a period of time." The cumulative impacts analysis should include "the incremental impact of the action when added to other past, present and reasonably foreseeable future actions." A description of all planned, pending and approved projects in the ROI should be presented along with a map illustrating the locations of those projects. The effects of the proposed action should be added to the expected development effects in the region to determine the total cumulative impact of the projects.

4. The Marine Corps is required by 40 CFR 1502.14(e) and 1505.2(b) to identify a Preferred Alternative and an Environmentally Preferable Alternative that may or may not be the same. EPA strongly encourages the Navy to focus on developing a preferred alternative that best balances the needs of the project and environmental quality.

5. Nearby residential areas should be documented and described in the EIS. The potential for effects on local residential communities should be discussed in the EIS in keeping with Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations. See **Environmental Justice**.

Water Quality

1. The EIS should discuss the potential impacts from groundwater recharge to the aquifers in the Lower Santa Margarita Basin from the proposed percolation ponds.

2. The EIS should ensure that the proposed action and alternative actions would satisfy the Cease and Desist Order (#94-52) and the National Pollutant Discharge Elimination System (NPDES) Permit or any related orders or permits issued to the Marine Corps by the San Diego Regional Water Quality Control Board.

3. The EIS should evaluate the potential of the proposed project to cause adverse aquatic impacts such as increased siltation and turbidity in surface water sources; changes in water quality and quantity; changes in dissolved oxygen, and temperature; and habitat deterioration.

4. The EIS should discuss specific monitoring programs that are in place or will be implemented to determine potential impacts on surface and drinking water quality and beneficial uses. Evaluate whether maintenance and protection of water quality can be guaranteed.

Section 404 Comments

The EIS should identify impacts to water, floodplains, and wetlands, including identification of Section 404 Clean Water Act requirements and proposals to ensure compliance with these requirements. EPA will review the proposed action for compliance with the Federal Guidelines for Specification of Disposal Sites for Dredged or Fill Materials (40 CFR 230) [hereafter referred to as the Guidelines], promulgated pursuant to Section 404(b)(1) of the Clean Water Act (CWA). To comply with the Guidelines, the proposed action must meet all of the following criteria:

- There is no practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem (40 CFR 230.10(a)).

- The proposed action does not violate State water quality standards, toxic effluent standards, or jeopardize the continued existence of federally listed species or their critical habitat (40 CFR 230.10(b)).

- The proposed action will not cause or contribute to significant degradation of waters of the United States, including wetlands (40 CFR 230.10(c)). Significant degradation includes loss of fish and wildlife habitat, including cumulative losses.
- All appropriate and practicable steps are taken to minimize adverse impacts on the aquatic ecosystem (i.e., mitigation) (40 CFR 230.10(d)). This includes incorporation of all appropriate and practicable compensation measures for unavoidable losses to waters of the United States, including wetlands. The EIS should fully address the feasibility of "in-kind" habitat mitigation measures.

Wetlands

In keeping with our 2/3/97 DEIS comment letter (see #13), EPA recommends that one or more of the alternatives examine the feasibility of developing demonstration projects with constructed wetlands.

Air Quality

The EIS should provide a discussion of air quality standards, ambient air quality conditions, and potential air quality impacts of the proposed project, including cumulative and indirect impacts. Federal agencies are required by the Clean Air Act to assure that actions conform to an approved air quality implementation plan. General Conformity Regulations can be found in 40 CFR Parts 51 and 93 (58 Federal Register, page 63214, November 30, 1993). These regulations should be examined for applicability to the proposed action.

Environmental Justice

In keeping with Executive Order 12898, **Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations** (EO 12898), the EIS should describe the measures taken by the Marine Corps to fully analyze the environmental effects of the proposed Federal action on minority communities, e.g. Indian Tribes, and low-income populations, and to present opportunities for affected communities to provide input into the NEPA process. The intent and requirements of EO 12898 are clearly illustrated in the President's February 11, 1994 Memorandum for the Heads of all Departments and Agencies.

General

If references to previous documents are used, the EIS should provide a summary of critical issues, assumptions, and decisions complete enough to stand alone without depending upon continued referencing of the other documents.

UNITED STATES MARINE CORPS
MARINE CORPS BASE
BOX 555010
CAMP PENDLETON CALIFORNIA 92055-5010

IN REPLY REFER TO:
5090.5C
ENVSEC/01
17 Mar 98

Mr. David J. Farrel, Chief
Federal Activities Office
U. S. Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, CA 94105

Dear Mr. Farrel:

This responds to your letter of February 27, 1998 regarding the Department of the Navy's Notice of Intent (NOI) to prepare a supplemental Environmental Impact Statement (EIS) for MILCON Project P-527B, Sewage Effluent Compliance, at Marine Corps Base, Camp Pendleton, California. We have reviewed and given careful consideration to the comments in your letter.

We do not believe that, under the applicable Council on Environmental Quality (CEQ) regulations (40 CFR 1500, *et al.*) implementing the National Environmental Policy Act (NEPA), withdrawal of our April 1997 Final EIS for this project is necessary as the proposed SEIS will "reinitiate" the EIS process. We believe the significance of the changes and the current circumstances relating to the project, as explained in the February 4, 1998 Federal Register NOI to prepare a SEIS, warrant a supplemental EIS. Section 1502.9(c)(1) of the CEQ regulations directs that agencies prepare a SEIS if the agency "(i)... makes substantial changes to the proposed action... or (ii) There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts." This is the circumstance that we face as a result of the late and unexpected decision by the City of Oceanside to deny Camp Pendleton access to its ocean outfall for disposal of excess effluent. As reflected in the April 1997 FEIS and the August 26, 1997 Record of Decision (ROD), previous indications were that such access would be available.

The major portion of this project will not change as a result of the denial of the use of the ocean outfall. As provided for in the FEIS, as much effluent as possible will be collected in percolation ponds in the Lemon Grove area. The FEIS anticipated that the excess volume of effluent that could not be percolated in these ponds, especially in the wet weather months, would have gone to the ocean outfall. This disposition of the excess effluent is the *only* changed part of the project that will be analyzed in the proposed SEIS. Consequently, the portions of the project providing for the piping of effluent from other sewage treatment plants to the previously planned percolation ponds in the Lemon Grove area do not require further analysis and decision based upon the FEIS and their approval in the ROD.

The SEIS will thoroughly evaluate other reasonable alternatives for the project now that the previously anticipated access to the ocean outfall is no longer available. We anticipate that the disposal of most, if not all, of the sewage effluent may be able to be accomplished through land disposal by increasing the size and capacity of the percolation ponds previously planned for in the FEIS. Additional testing is currently underway to determine the percolation capacities of the original, adjacent, and other potential sites for these ponds. If this testing indicates that the percolation rates of the original and adjacent sites will not accommodate the volume of effluent, the other potential percolation locations will be considered. Although percolation now appears to be the preferred alternative, other reasonable alternatives, as reflected in the NOI, as well as combinations of these alternatives, will also be evaluated to determine a viable means of disposal of all of the effluent. Alternatives that may be raised during the scoping process, agency consultations, and the comment period will also be considered.

We appreciate your concern that the proposed alternatives identified in the NOI are sufficiently different than those originally proposed in the FEIS so t a SEIS "... would be confusing to the decision maker and the public." We believe, however, that the SEIS can be developed in such a fashion that both the decision maker and the public will fully understand the project, its environmental ramifications, and the measures proposed to avoid or reduce those

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impacts. Further, this approach is in line with the CEQ regulation (1502.22) encouraging incorporation by reference when possible to " cut down on bulk without impeding agency and public review of the action."

We thank you for your comments relating to the project and especially for those concerning matters and issues that must be addressed in the NEPA analysis of these new proposed alternatives. We look forward to working with the Region IX EPA staff as we develop the additional NEPA documentation for this project so that an environmentally informed decision may be properly made.

Sincerely,

K. W. QUIGLEY
Lieutenant Colonel, U.S. Marine Corps
Deputy Chief of Staff, Environmental Security

Copy to:
WACO
Cmdr EFD SW (Ms. Taylor)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Field Office
2730 Loker Avenue West
Carlsbad, California 92008

MAR 2 0 1998

Vicky K. Taylor
Code 533.VT
Southwest Division
Naval Facilities Engineering Command
1220 Pacific Highway
San Diego, California 92132-5190

Re: Notice of Intent to Prepare a Supplemental Environmental Impact Statement for the Military Construction Project P527B, Sewage Effluent Compliance, Lower Santa Margarita River Basin, Marine Corps Base Camp Pendleton, San Diego County, California

Dear Ms. Taylor:

The U.S. Fish and Wildlife Service (Service) has reviewed the referenced Notice of Intent (NOI) dated February 4, 1998, regarding preparation of a supplemental Environmental Impact Statement for the Sewage Effluent Compliance Lower Santa Margarita River Basin Project (EIS). As stated in the NOI, Marine Corps Base Camp Pendleton has proceeded with on-base construction of the effluent collection and percolation pond elements of the disposal system described in the Final Environmental Impact Statement (FEIS). The supplemental EIS will analyze alternatives to provide additional and sufficient disposal capacity in light of the City of Oceanside's disapproval of the use of an ocean outfall within that community. The ocean outfall was a component of the original project design.

The purpose of the proposed action is to comply with Cease and Desist Orders issued by the San Diego Regional Water Quality Control Board. The proposed action as described in the FEIS would replace live-stream effluent discharge from existing Sewage Treatement Plants (STP) 1,2,3,8, and 13 with ocean discharge. Implementation of the proposed action would result in the removal of 3.5 to 4.4 million gallons per day of secondary treated effluent from the Santa Margarita River. The project would require the construction, installation, and operation of a system of pumps, pipelines, and associated facilities.

The Service believes that the proposed project may have the potential for significant environmental impacts to biological resources. As stated in the "Programmatic Groundwater/Riparian Habitat Assessment at MCB Camp Pendleton" (MCB Camp Pendleton Environmental Security Office 1995) (Groundwater Assessment) the elimination of sewage effluent generated by STP 3 could lower groundwater levels by five feet or more during extended drought conditions. The Groundwater Assessment concluded that an

approximate 80 acre area in the Chappo and Ysidora Subbasins were likely to be affected by the removal of the effluent discharge. The Service is concerned that the reduction in flows will lower ground water levels which may result in the degradation and/or loss of downstream wetland habitats especially during extended periods of drought. The Santa Margarita River supports a mosaic of vegetation communities associated with riverine systems including southern willow riparian forest, southern willow scrub, and freshwater marsh. These vegetation communities provide habitat for federally listed species, and over 90 species of migratory birds.

As stated in our comment letter, dated February 7, 1997, in response to the draft EIS, the Service is concerned with the indirect effects to downstream riparian habitat within the Santa Margarita River as a result of relocating the current effluent discharge point. We are also concerned that alternatives in the supplemental EIS may be constrained due to the fact that construction has already begun on the pipeline and Lemon Grove percolation pond. We recommend that a full range of alternatives be analyized in the supplemental EIS rather than restricting the analysis to alternatives for the ocean outfall component of the project. We also recommend that the supplemental EIS address tertiary treatment of the effluent and the use of this water to recharge the upstream groundwater basin. The supplemental EIS should consider use of tertiary treated water to facilitate wetland establishment at the Ysidora Basin mitigation site.

In addition to the above concerns, the Service offers the following specific information and recommendations to assist you in planning for the preservation of sensitive wildlife species and habitat within the project area and as a means to assist you in complying with pertinent Federal statutes. In order to facilitate the evaluation of the proposed project from the standpoint of fish and wildlife protection, we request that the supplemental EIS contain the following specific information:

1) A complete discussion of the purpose and need for the project.

2) A complete description of the proposed project, including all practicable alternatives that have been considered to reduce project impacts to threatened and endangered species, wetland areas, coastal sage scrub, other sensitive habitat types, and fish and wildlife resources.

3) Specific acreage and descriptions of the types of wetland, coastal sage scrub, and other sensitive habitats that will or may be directly or indirectly affected by the proposed project or project alternatives. An analysis of potential impacts to estuarine plant communities from the use of freshwater percolation ponds at the Lemon Grove site should be addressed.

4) Descriptions of the biological resources associated with each habitat type. These descriptions should include both qualitative and quantitative assessments of the resources present on the proposed project site and alternative sites.

5) An assessment of direct, indirect, and cumulative project impacts to fish and wildlife and associated habitats. This would include the direct project footprint as well as impacts to upstream and downstream habitat. All facets of the project should be included in this assessment.

6) A list of Federal proposed or listed species and critical habitat, state-listed species, and locally sensitive species that are on or near the Santa Margarita River project site including the estuary. A detailed discussion of these species, including information pertaining to their local status and distribution, should be included in this report. The anticipated or real impacts of the project on these species should be addressed fully. The Service is particularly interested in any and all pertinent information and data pertaining to potential or real impacts to: a) currently Federally listed and proposed species, and critical habitat, if designated, including the arroyo toad (*Bufo microscaphus californicus*), tide water goby (*Eucyclobius newberryi*), Quino checkerspot butterfly (*Euphydryas editha quino*), coastal California gnatcatcher (*Polioptila californica californica*), the least Bell's Vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax trailii extimus*), California least tern (*Sterna antillarum browni*), western snowy plover (*Charadrius alexandrinus nivosus*), pacific pocket mouse (*Perognathus longimembris pacificus*), Stephens' kangaroo rat (*Dipodomys stephensi*), and thread-leaved brodiaea (*Brodiaea filifolia*); b) State listed Species including the Belding's savannah sparrow (*Passerculus sandwichensis beldingi*); c) raptors; d) neotropical migratory birds; e) monarch butterfly wintering areas; and f) species considered sensitive by Federal and State authorities.

7) Specific mitigation plans to fully offset project-related impacts, including proposals for mitigating the cumulative impacts of direct and indirect habitat loss, degradation, or modification. Adverse project-related impacts should be mitigated through the preservation, re-creation, or revegetation of impacted habitat types. Mitigation measures that would be specifically implemented for species covered in the Programmatic Biological Opinion (1-6-95-F-02) Programmatic Activities and Conservation Plans in Riparian and Estuarine/Beach Ecosystems on Marine Corps Base Camp Pendleton, should be identified including mathematical calculations associated with formulas specified in the Opinion. The location, implementation schedule, and specifics associated with each mitigative measure should be described.

8) An analysis of the effects of the project on the hydrology of the Santa Margarita River including all wetland communities within the sphere of influence of the project. Of particular importance is an analysis of the potential ground water impacts associated with water diversion out of the Santa Margarita River.

12) A thorough analysis (qualitative and quantitative) of the cumulative impacts to the Santa Margarita River system from projects expected to occur along the Santa Margarita River including the Base Realignment and Closure, Blue Beach Inland Access (North River Road Expansion), Ultimate Clear Zone (project PA303M), Aircraft Parking Apron and Fueling Pits

(project P-026T), New Potable Water Wells in the Santa Margarita Flood Plain, Convert Short Approach Landing System to Airfield Lighting Sequence Flashing System (project PA403R), training and maintenance activities. A discussion of upstream (from Camp Pendleton) activities which effect the Santa Margarita River system should be included in the cumulative impact section.

The Service appreciates the opportunity to comment on the referenced NOI and looks forward to working with representatives of Marine Corps Base Camp Pendleton and Southwestern Division Naval Facilities Engineering Command. If you should have any questions pertaining to these comments or wish to arrange a meeting to discuss the project and anticipated impacts to fish and wildlife resources, please contact Doreen Stadtlander of my staff at (760) 431-9440.

Sincerely,

for Jim A. Bartel
Assistant Field Supervisor

Southwest Center for Biological Diversity

Ms. Vicky Taylor, Code 533.VT
Southwest Division, Navel Facilities Engineering Command
1220 Pacific Highway
San Diego CA 92132-5190

March 23, 1998
Delivered via facsimile
Hard copy to follow

RE: Notice of Intent to prepare a Supplemental Environmental Impact Statement for the Military Construction Project P-527B, Sewage Effluent Compliance, Lower Santa Margarita River Basin, Marine Corps Base Camp Pendleton

Dear Ms. Taylor,
Thank you for the opportunity to offer scoping comments on the above project. We hope you will take the following comments into consideration during production of the draft supplemental EIS.

We support the concept of returning the maximum amount of water possible into the Santa Margarita River, either directly (after biological, not chemical, treatment) and/or via percolation. Return of wastewater, in combination with strict water conservation, is perhaps the best long term solution to maintenance of high quality riparian habitat along the Santa Margarita River.

Every attempt should be made to locate percolation ponds, new advanced water treatment facilities, irrigation infrastructure, etc. outside of areas supporting riparian habitat and or any special status species including but not limited to the southwestern willow flycatcher, least Bell's vireo, arroyo toad, tidewater goby. All ponds and other facilities would ideally be located within the Santa Margarita River flood plain, but outside of riparian habitat areas, so as to provide for maximum ground water recharge. We recommend hydrological studies in an effort to determine the best location of direct discharge and/or percolation ponds for efficient wastewater disposal as well as maximum benefit to regionally significant biological resources.

During consideration of potential effects of any construction, water diversion, or recharge on special status habitats and/or species, please carefully consider indirect and cumulative effects to such resources in addition to those direct effects of any proposed action. A list of other projects considered for the Santa Margarita flood plain and potentially affecting a number of special status species and riparian habitats is contained in the Wetlands Biological Opinion and should be updated and analyzed in greater detail in relation to this project.

With these comments in mind, we are most supportive of Alternative 3, with limited expansion of the Lemon Grove Ponds so as to avoid impacts to the eucalyptus grove, and with the exception of construction of an advanced water treatment facility adjacent to Sewage Treatment Plant 13. This facility should be located elsewhere where riparian habitat and special status species will not be affected.

This concludes our comments. Please contact me if you have any questions or wish to discuss these comments in greater detail.

Sincerely,

David Hogan

David Hogan

SANTA MARGARITA RIVER WATER MANAGEMENT PROJECT

pob 897 Murrieta CA 92564 909/678-6328

3/21/98

Dept of the Navy
1220 Pacific Highway
San Diego CA 92132

CITIZENS FOR RESPONSIBLE WATERSHED MANAGEMENT comment to:
2/11/98 Notice of *Preparation of a Supplemental Environmental Imapct Statement for Project P-527B, Sewage Effluent compliance.*

The proposed wastewater treatment alternatives do not address *onsite* treatment techniques described as *"alternative systems for small communities"* by the US Environmental Protection Agency. While it is understood that the high density of Base population seems to dictate *centralized* sewage disposal in the 'traditional' manner, technicians throughout the Nation have developed a multitude of ways to reduce total effluent production to central systems.

The conventional wisdom that *larger is better* holds true where soils, climate and geology constrain planning but does not apply to this Base where these factors are remarkably favorable for onsite treatment or effluent treatment in remote leach fields. While the description "Small Wastewater Systems" may seem inappropriate for this populous Base, please note that it is composed of several distinct communities and many individual structures in close proximity to soils that are appropriate for safe, inexpensive treatment of septic tank effluent. (Soils maps indicate thousands of acres of porous, well-drained soils adjacent to habited areas.) If USMC planners set aside perceptions of wastewater management as a centralized planning effort, opportunities for immediate, low-cost sewage treatment become visible.

Maximizing wastewater treatment on each site would contribute incrementally to sizing the central systems and replenishing groundwater supplies that provide water to the Base. While this would require re-evaluation of each structure's production of wastewater and a reassessment of soil conditions in its vicinity, most needed information is already available and could quickly be assembled by competent specialists. Various combinations of septic tanks, absorption trenches, pretreatment systems, serial-dosed-pressure-vacuum distribution, filtration, constructed wetlands, evaporation beds and landscape/agricultural irrigation would be suitable for disposing of this effluent depending on each site's conditions.

Some areas where percolation is not appropriate would require conveyance of septic tank or lagoon effluents to remote areas with standard leach fields - contour-following soil absorption trenches - flood-micro-spinkler irrigation systems, tailored to suit soil conditions and desired groundwater levels. The mode of treatment will differ with each site and may entail transport of effluents for considerable distances, dictating a plan too complex for local offices that lack specialists in each of the many disparate methodologies. To be comprehensive and cost-effective the final plan must be integrated into a watershed management plan by the most qualified experts available so that it best balances each component's cost and public benfit. The Project clearly demands highly specialized wholistic water management planning, incorporating current "off-the-shelf" techniquesthat conform to present State regulations while also applying "innovative" or "experimental" techniques that prevent premature obsolescence as ever-tighter restrictions are imposed.

executives who manage complex Base affairs, it is in conflict with good management principles. The availability of first-class, free expertise from public servants Nationwide dictates fullest use of their abilities through careful review of the many "best available alternatives". The views I present here for CRWM are a distillation of advice from its experts and several thousand technicians, civil engineers and planners in private and public service.

USMC could make use of this expertise by inviting State and federal experts to review the entire site within a watershed management setting and provide suggestions for a comprehensive approach to wastewater management. *(I recommend consulting Shroeder and Tchobanoglous of the University of California-Davis, who have written UC CA textbooks on the subject and designed systems for San Diego-Escondido. Schroeder also provided a proposal for a Santa Margarita River watershed planning study in 1989.)*

Several commenters pointed out that the proclaimed intent in this NOP to "dispose" of sewage waters implies a perception that waste-bearing water is a nuisance rather than a valuable resource. They suggested that a term like "usefully dispose of" or "cleanse" or "recycle" be adopted. This may be appropriate to assure potential commenters that USMC planners fully appreciate the value of effluent waters even though past planning efforts have not made fullest use of "latest and best" technologies.

It is understandable that long-range planning excessively burdens Base staffers who see a multiplicity of dangers facing this Nation and wish to maximize preparedness. Those in the chain of command could, however, minimize these burdens by inviting impartial experts to perform a quick review and illustrate every alternative clearly and without unneeded complication. The Base Commander could best render an appropriate decision after reviewing alternatives presented by planners he knew to be competent and not influenced by subcontractors, politicians or his own staff.

CRWM seeks only to enhance this Commander's ability to manage effectively, not to create problems for those who manage his information supply. In our view, the Base Commander needs the best intelligence he can get and this would come most quickly from eminent soil-wastewater management specialists such as those of state and federal agencies.

Finally; USMC planners should not lose sight of their obligation to observe State laws requiring *fullest use* of Waters of the State. In consideration that treated effluent is suitable for irrigation and groundwater recharge, every opportunity for public benefit from these uses should be examined. These planners should also keep in mind specific instructions of the CA Legislature that State waters be protected from contamination. Both livestream disposal and percolation of effluent waters though lowland soils violate this directive.

In sum: This NOP did not illustrate the many planning options suitable for consideration by those who wish to provide input. The supplemental report that derives from it should do so.

Every reasonably expectable impact should be addressed in enough detail to allow meaningful comment to the Final Environmental Impact Report. Merely mentioning that rainwater conservation *could* be part of an alternative to the proposed disposal planning would not be adequate. Nothing less than providing estimates of costs and benefits of this (as part of an alternative) from impartial experts would fulfill the intent of the Legislature and Congress.

James Marple
for Citizens for Responsible Watershed Management

copy EMA/RCD, GBC, RWQCB, CA/US EPA

The GreenBelt Committee
32750 Rome Hill Road Lake Elsinore CA 92530 madcreek@cosmoaccess.net

March 22, 1998
USMC Camp Pendleton
Comments re: SEIS - NOP Sewage Effluent Alternatives

In our examination of the U.S. Marine Corps Notice Of Preparation of a Supplemental Enivironmental Impact Report we note the statement *"all alternatives will require the construction of percolation ponds..."*. We are aware of a broad range of alternative wastewater management systems which do not require percolation ponds and request that these be fully explored. We refer US EPA document 830/F-92/001 of May, 1992. This gives a comprehensive view of the many planning and design techniques applicable to an area such as Camp Pendleton.

After looking far beyond the mounds of trivial and irrelevant information typically provided by local wastewater planning agency offices and private consultants we found a number of community wastewater management systems that would be appropriate for the varied conditions of the Base. We believe these should be fully evaluated before a decision is made regarding the four alternatives identified in this NOP. To this end, we ask that the following observations be given consideration in preparation of a Draft Environmental Impact Report:

--- While the phrase 'alternate systems' may evoke images of radical or impractical methods USMC planners may note that most non-urban homes Nationwide use alternate systems and that this planning predates the centralized systems we see in most urban areas. The greatly reduced complexity of 'alternate systems' should not be taken as an indication that they are less effective or reliable, nor should specious claims of 'economies of scale' sway planners into preferring centralized systems. It is the fact of reduced complexity that makes these systems, as proven at thousands of locations, offer significant savings in planning-engineering-construction-maintenance costs. Unfortunately, these same savings pressure some public servants into rejecting low-tech, low-cost systems that pose a threat to their long-term job security.

--- Senior planners are likely to be offended at a suggestion that they lack sufficient expertise but capable and honest planners know that limited budgets and heavy work loads preclude research that would keep them abreast of 'latest and best' technologies. This field is so vast and moving forward so rapidly that no agency can be fully informed. Individuals who seek to exercise due diligence can compensate for shortcomings within their bureau by finding and evaluating every reasonable alternative to the best of their ability and presenting their findings as widely as practicable. Such research is obligatory for public servants and a specific ethical/legal requisite for every civil engineer.

--- It should be noted here how application of 'latest and best' planning and design techniques is more likely to accelerate than delay construction of systems that bring the Base into compliance with RWQCB regulations. (Knee-jerk negativists are certain to argue that incorporating individual site systems into a Base plan will cause "red tape' delays. This is a standard tactic used to obstruct the introduction of planning that might threaten their tenure.) In fact, State officials are solely concerned with protecting water quality and minimizing cost concern and so would cooperate fully in a 'piecemeal' approach if they are shown by fully accredited scientists (such as those at State Universities) how the *whole* of such planning accomplishes desired ends. This cooperation would allow immediate installation of the simplest and most inexpensively constructed elements of such a plan (which elements are likely to be the most cost-effective and quantitatively productive) while more complex and time-consuming studies/design progressed to complete the systems.

--- Protection of surface and groundwater quality is best achieved by dispersal of effluent waters through soils and vegetation that either retain their pollutants in harmless concentrations or modify these pollutants into harmless substances. Decentralized systems can provide this protection by eliminating the need for lagoon or live-stream "disposal" of effluent waters.

--- Careful evaluation of irrigation and trench effluent treatment system benefits to the natural and human environment will reveal that this even has a positive affect on microclimate conditions, increasing annual precipitation and moderating temperature extremes. (see studies H. Rubin, now head of Technion U in Israel)

--- The benefits of stimulating grass and tree growth that crowds out chaparral in critical areas has been recognized by fire suppression experts and should of course be factored into the siting of effluent treatment areas, as these can enhance the restoration of grasslands and forests. Intelligent designed effluent disposal systems can enhance native vegetation in ways that diminish fire hazard while increasing rainwater retention.

--- Flooding on the Base exacerbated by landsliding in the Temecula Gorge of the Santa Margarita River may seem irrelevant to discussions of sewage disposal. It should be noted, however, that a comprehensive watershed management plan to minimize these potentially disastrous events would produce actions that stabilize and increase river flows by raising water tables. This would directly impact both the loading of effluent waters and the volume of dilution waters available for effluent treatment programs, altering the planning equations for these programs.

---This supplemental statement should address the costs, time frame and benefits of generating a watershed management plan for the entire Santa Margarita River basin as a means to minimize costs and maximize effectiveness/benefits of a sewage effluent cleansing program. Viewing this solely as a "disposal" problem only perpetuates the outdated and inappropriate attitudes that misguide planners into ignoring latest and best planning and design techniques. Piecemeal planning of sewage systems is as contrary to common sense as piecemeal management of rainwater runoff.

--- Rainwater conservation was not adequately addressed in the original Environmental Impact Statement. Without this, the document did not meet CEQA/NEPA requirements. This supplemental report will also fail to comply should it fail to fully explore factors that have significant impact on the cost and success of proposed alternative methods of sewage effluent "disposal". No reasonable person will deny the direct link between water supply quality and sewage effluent treatment methods. No well-informed planner will reject the thesis that effluent waters recycled through low-tech onsite systems that make fullest use of cleansing soils and vegetation can bring great public benefit.

--- Viewing sewage as but one element in a watershed management plan reveals that the alternatives listed do not make full use of fortunate circumstances of location-climate-topography-geology and the resulting composition of soils. While the proposed plans will indeed dispose of effluent in a relatively safe manner and comply with State regulations, planners have an obligation to recognize that **these are outdated and inadequate regulations,** overdue for an updating that will cause further problems in compliance. Applying ordinarily sensible treatment methods that clean sewage waters most effectively and at least cost so that these waters are suitable for re-use is an obviously desirable end.

--- This Notice of Preparation shows that USMC planners have been willing to rectify their failure to include upstream concerned citizens in their original NOP. We hope that this signifies a willingness to fully address planning alternatives that have been proven successful at a multitude of sites across the Nation. Rainwater conservation is not a fad, not a radical notion, not an extremist idea. It has been standard procedure throughout the World's history wherever competent and honest planners served the public. Failure to fully evaluate the potential for minimizing sewage effluent treatment costs and maximizing public benefits from re-use of effluent waters would place USMC planners in apposition to the mainstream of technical expertise. This project should make best possible use of every opportunity for local disposal/treatment of effluent waters. Merely applying archaic methods because of a disinclination to find and evalute every potential program would be a dereliction of duties to protect public interests and apply public funds to best advantage.

--- Members of the GBC have visited Camp Pendleton on many occasions with a view to providing helpful suggestions that might aid integration of this planning with that of upstream areas. Our concerns are centered on a perception that local officials lack expertise in low-tech wastewater management and have been unable or unwilling to avail themselves of the abundance of information we have seen. We believe that the advice of prominent unbiased experts would be of great benefit to the Commanding General, as a balance to advice of Staff. While this may be seen as a threat to their jobs by some Staff members, the insignificant cost of importing "outside" talent would produce the most acceptable result to those who worry about the economic and environmental costs of maintaining the Base. We consider it essential that the Commanding General is furnished with the best possible intelligence regarding alternatives to overly-centralised sewage disposal systems and live-stream dumping so that he can properly evaluate the public benefits of each.

---We believe it would be appropriate for USMC planners to contact Professor Edward Shroeder of the University of California, as he provided our group with a "game plan" for water resource management in the Santa Margarita River Basin nearly ten years ago. We have discussed his proposal with dozens of similarly prestigious experts and found them to be both in full agreement with his aims and highly impressed with his ability and impartiality. (We were particularly impressed with his perception that providing public services of the UC toward better conceptual water planning was a routine obligation.)

---We are aware of a wide variety of inexpensive methods for direct disposal of septic tank effluent and we know that a majority of land on the Base is covered by quite porous soils that are capable of rapid percolation of effluents. We know that land application of effluents is generally the most appropriate method of disposal where soils are well-drained, as on most of the Base. (Planners need to get away from trying to percolate water on valley floors just because it naturally drains to these. The moderate to highly porous soils that predominate offer ample opportunity for low-cost filtering of wastewaters to groundwater.)

---Our concern for enhancing natural vegetation as a means to provide a wide range of public benefits leads us to request that you fully explore the many direct-disposal techniques available and bring in the most competent and experienced experts you can find in this Nation to aid in developing the programs needed for applying these techniques. Our concern for avoiding contamination of estuarine waters with the many complex chemical compounds found in wastewater cannot be overemphasized, as we have seen far too many cases where wildlife as well as humans were negatively impacted by doses of what were considered harmless chemicals. While the concentration of contaminants in wastewater that flows to live-stream disposal is required to be within strict limits we have seen that unpredicted conditions downstream have caused these chemicals to be concentrated so that they become damaging to the natural environment. Although your budget may allow only rough estimates of the costs of alternatives, these "educated guesses" are an essential part of any environmental impact report. These give concerned citizens a framework within which they can provide the benefit of their talents in research, in consideration of specific methods and in formulation of conceptual alternatives.

We have in hand careful compilations of the costs of retaining rainwater as a means to enhance quantity and quality of water supplies and have viewed similar compilations of the costs of onsite sewage treatment compared to those of centralized systems. These costs, when compared to the much higher ones of centalized systemsn and the many benefits from low-cost, clean, plentiful water, dictate that public servants apply their energies and talents to the fullest in finding and evaluating alternatives ways of managing sewage waters.

---We consider it irresponsible to apply only traditional California disposal techniques when far more sophisticated and cost-effective ones have been developed and proven elsewhere. It is true that we have a broad range of laws that should prevent degradation of the natural environment that results from a failure of planners to use due diligence in finding and adapting the most suitable techniques. It is also true that budgetary and political pressures upon agency staffs often causes undeserved permits to be issued. For this reason we intend to follow the progress of this Project carefully and to publicize deviations from a sensible program of finding and applying the most suitable techniques.

Thank you for your consideration of our concerns.
Madlyn Creekmore - for the GreenBelt Committee

APPENDIX B
SUPPLEMENTAL BIOLOGICAL TECHNICAL REPORT

SUPPLEMENTAL BIOLOGICAL TECHNICAL REPORT
P-527B SEWAGE EFFLUENT COMPLIANCE PROJECT
LOWER SANTA MARGARITA BASIN
MARINE CORPS BASE CAMP PENDLETON

Prepared for:
Southwest Division
Naval Facilities Engineering Command
1220 Pacific Highway
San Diego, California 92132-5187
Contact: Vicky Taylor, Project Leader

Prepared by:
KEA Environmental, Inc.
1420 Kettner Boulevard, Suite 620
San Diego, California 92101
Contact: Christina Schaefer, Senior Biologist

Christina Schaefer, Senior Biologist

December 1998

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1.0 INTRODUCTION

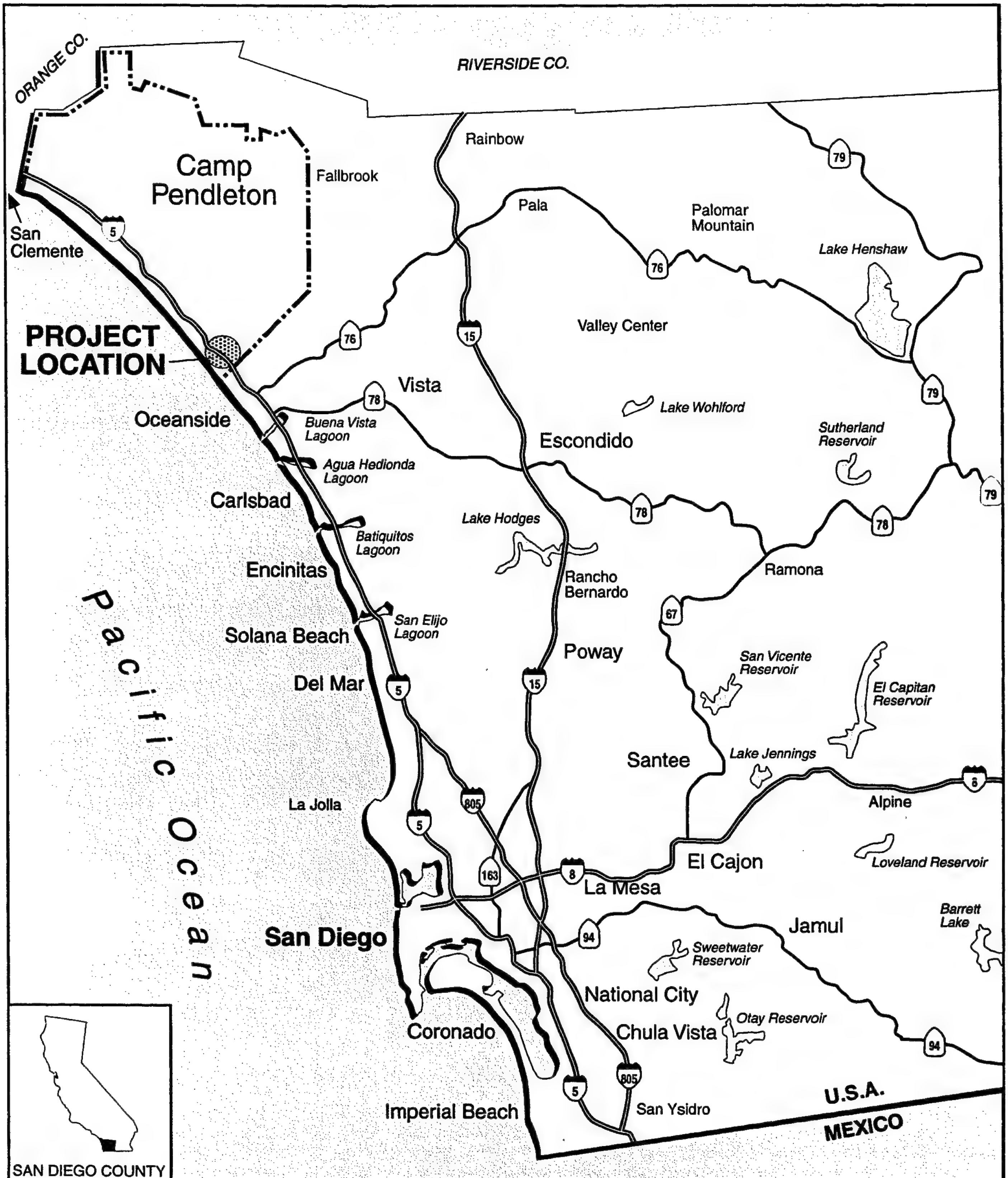
This Biological Technical Report (BTR) was prepared by KEA Environmental, Inc. (KEA) for Southwest Division, Naval Facilities Engineering Command (SWDIV) and Marine Corps Base (MCB) Camp Pendleton. It describes the existing conditions, impacts, and potential mitigation measures for the proposed action. The project alternatives include the placement of a sewage effluent pipeline and associated treatment facilities, storage basins, and effluent discharge or re-use at various locations in the southwest region of MCB Camp Pendleton, California (Figures 1 and 2). The purpose of this report is to provide biological baseline data in compliance with the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), and the Clean Water Act (CWA).

This BTR was prepared as a supplement to the existing biological data for the original Military Construction (MCON) P-527B Sewage Effluent Compliance project. The *Final Environmental Impact Statement/Report (FEIS/R), Sewage Effluent Compliance Project Lower Santa Margarita Basin Marine Corps Base Camp Pendleton* (1997) addressed a system of pumps and piping to deliver effluent from STPs 1, 2, 3, 8, and 13 to percolation ponds and an existing ocean outfall for discharge. Each of three alternatives evaluated included an element of effluent or brine discharge through the ocean outfall at Oceanside, California. During final consideration of the proposed action, the use of the ocean outfall was not approved by the City of Oceanside City Council. Therefore, the original proposed action was not fully implemented and part of the proposed action has been revised. This BTR analyzes alternative ways to provide additional and sufficient disposal capacity on-Base without the use of an ocean outfall and thus achieve compliance with the San Diego Regional Water Quality Control Board (RWQCB) Cease and Desist Orders.

1.1 PROJECT DESCRIPTION

The Sewage Effluent Compliance Project for the Lower Santa Margarita Basin proposes to achieve compliance with the National Pollution Discharge Elimination System (NPDES) Cease and Desist Orders issued by the San Diego RWQCB for STPs 1, 2, 3, 8, and 13. Compliance with the Cease and Desist Orders is proposed through implementation of one of the following five alternatives and the no project alternative:

1. Alternative 1: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains;



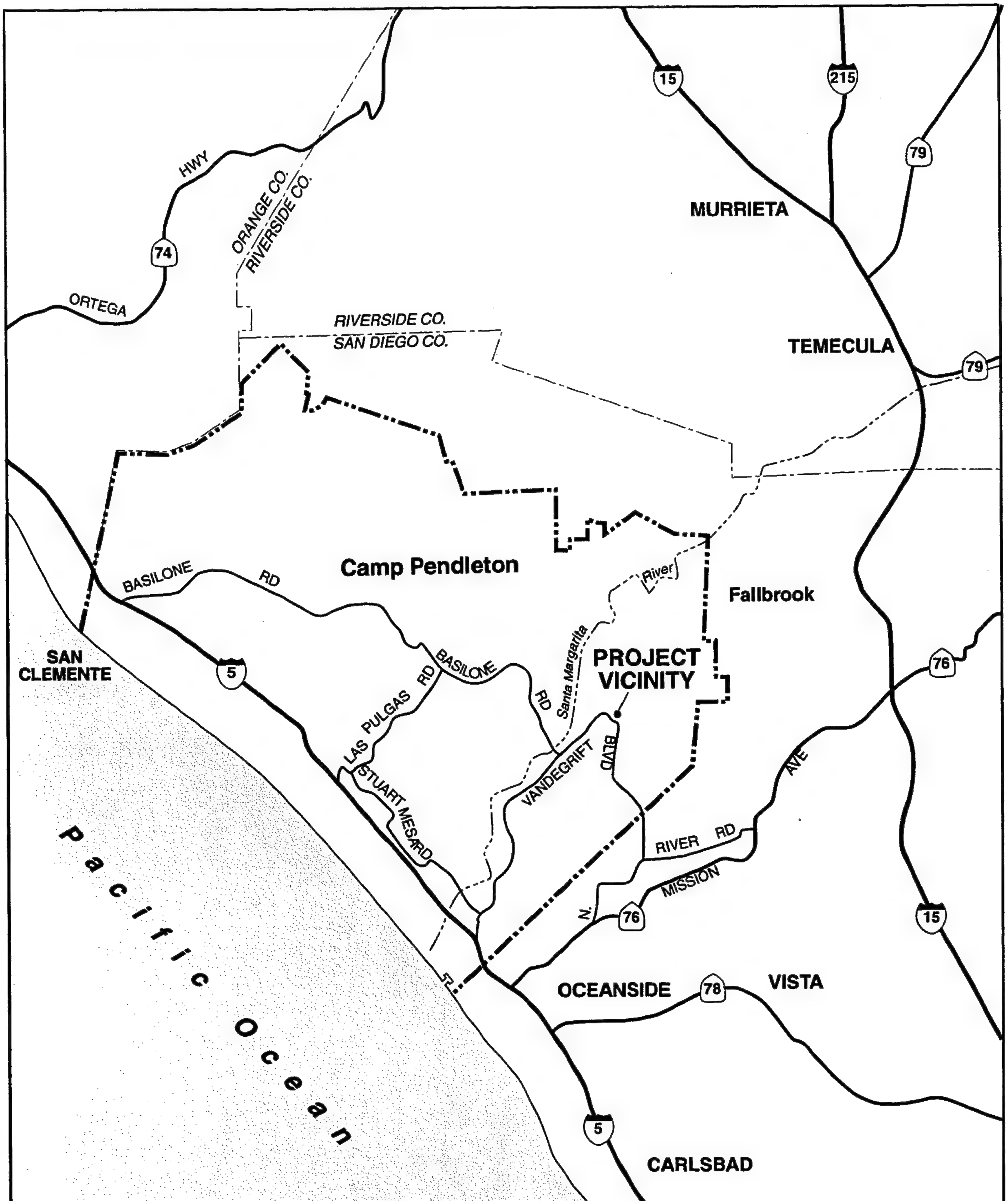
N

No Scale

Figure 1

Regional Location Map

9416 P-527/Figures/Figure 1-1 Regional Map



Camp Pendleton Boundary

N

0 5 MILES

Figure 2

Vicinity Map

9704 Deluz/Figures/Figure 2 Vicinity (Bio) Map

2. Alternative 2: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains plus Advanced Wastewater Treatment and Reclamation of a Portion of the Effluent (Preferred Alternative);
3. Alternative 3: Tertiary Treated Effluent Blended with Secondary Effluent for Groundwater Recharge at Ysidora Flats;
4. Alternative 4: Advanced Wastewater Treatment and Discharge in Cased Wells at Lemon Grove;
5. Alternative 5: Advanced Wastewater Treatment with Irrigation of Agricultural Fields and Discharge in Cased Wells; and
6. No Action Alternative.

In addition to the construction of disposal and/or storage ponds and advanced treatment facilities, each of the alternatives would involve the construction of sewage pipelines and pipeline turnout areas.

1.2 PROJECT LOCATION

The focused planning area consists of three study sites, encompassing five project alternatives, located within the southern portion of MCB Camp Pendleton. The alternative sites are dispersed but regionally bounded by Stuart Mesa and the Mass-3 Area to the north, DZ Morro Hill to the east, the Pacific Ocean to the west, and the City of Oceanside to the south (Figure 2). The following sites are described in this BTR: the Lemon Grove Ponds site, the Advanced Water Treatment Facility (AWT Facility) adjacent to the existing Sewage Treatment Plant (STP) 13 site, the Ysidora Flats site, and the STP 2 site.

The Lemon Grove Ponds site was previously addressed in the FEIS/R. The Lemon Grove site is bounded by the Santa Margarita River and Stuart Mesa Road to the north, Vandegrift Boulevard to the east, and Interstate 5 (I-5) to the west and south. The AWT Facility site is bounded by STP 13 to the west and north, Vandegrift Boulevard to the east, and the Base recycling center to the south. The Ysidora Flats site occurs on the floodplain of the Santa Margarita River and is bounded by Vandegrift Boulevard to the north, south and west, and the Santa Margarita River to the east. STP 2 occurs along the slopes immediately to the east of Pilgrim Creek and is bordered by this creek to the west and Vandegrift Boulevard to the east, the Rodeo Grounds to the north and the City of Oceanside to the south.

2.0 METHODOLOGY

2.1 DATA SOURCES AND REFERENCES

Background information for this document stems from the original FEIS/R for the Santa Margarita Sewage Effluent Compliance Project (1997), and the following two U.S. Army Corps of Engineers (USACOE) permit documents: Section 404 Permit File # 96-000067-ES, February 25, 1997 (Base Realignment and Closure (BRAC) project permit); and, Section 404 Permit File # 96-00129-ES, April 6, 1998 (Levee project permit). The BRAC project is the realignment to MCAS/MCB Camp Pendleton; the Levee project is the combination of the Santa Margarita River Flood Control Project (P-010) and the Basilone Road Bridge Replacement Project (P-030).

Ysidora Flats was surveyed in 1992 as part of this initial project. Biological resources at this site were evaluated based on existing biological information within the appendices of the original P-527B FEIS/R and data sources for the project vicinity (e.g., Camp Pendleton mapping and the California Natural Diversity Data Base "Rarefind"), as well as current aerial photographs of the site. Additionally the BRAC Wetlands Mitigation Project report (Tierra Data Systems 1997) was used to evaluate existing conditions of the Ysidora Flats site. Biological resources were also mapped in the field using 1:2,400 scale topographic Marine Corps Base maps of the project area issued by Camp Pendleton Public Works Office and supplemented with digital data for sensitive plants and wildlife species (except least Bell's vireo and southwestern willow flycatcher). The original field surveys were performed for a different set of alternatives, only one of which (AWT site) is included in this BTR. The AWT Facility/Equalization Basin site was surveyed on foot on December 23 and 29, 1997 and March 11, 1998. STP 2 and the proposed ten-inch force main pipeline route was surveyed on foot on September 15, 1998. All recent biological surveys are summarized in Table 1.

Table 1
Schedule of Biological Surveys

Type of Survey	Date	Time	Biologist
Vegetation	23 December 1997	0900-1600	John Messina
Wildlife	23 December 1997	0900-1600	Lyndon Quon
Vegetation and Wildlife	29 December 1997	1215-1245	Lyndon Quon
Vegetation	11 March 1998	0900-1700	John Messina
Wildlife	11 March 1998	0900-1700	Lyndon Quon
Vegetation	15 September 1998	0830-1430	John Messina
Wildlife	15 September 1998	0830-1430	Kim Beyer

Weather conditions during the field surveys consisted of clear skies with calm winds between 0 and 8 kilometers per hour (0 and 5 miles per hour). Temperatures ranged from 14° to 22° Centigrade (57° to 72° Fahrenheit).

Plant species were identified by direct observation. Animal species were identified by both direct observation and indirect sign (i.e., scat, tracks, calls, nests, and burrows). Scientific nomenclature used throughout this report conforms to Hickman (1993) and Skinner and Pavlik (1994) for plants, Holland (1986) for vegetation communities, and Laudenslayer et al. (1991) for wildlife.

2.2 VEGETATION MAPPING

Vegetation communities were classified and mapped in the field from strategic topographic vantage points. Habitats were classified based on the dominant and characteristic plant species, plant physiognomy, and soils in accordance with Holland's description of natural communities (1986), as modified by Oberbauer (1996). The focused study area was mapped for vegetation communities.

Each habitat type was delineated as a habitat polygon on the compiled vegetation maps and input into a geographic information system (GIS) data base and mapping system. Acreages were calculated using the GIS.

2.3 PLANT SURVEYS

2.3.1 General Inventory

All plant species encountered during the botanical surveys were identified in the field or sampled and identified in a laboratory setting. A floral inventory that includes all plant species detectable during the late fall/early winter survey period was compiled and is included as Attachment A to this document.

2.3.2 Sensitive Plant Species

The focused study area was surveyed for the presence of sensitive plant species according to standard survey protocols for plants. This involved searching for sensitive species expected in the region by walking meandering transects through the various habitats and focusing more effort on areas with a high potential for sensitive plant presence, such as openings in the shrub canopy and around rock outcrops. Sensitive species are those listed by the federal and state government and other wildlife monitoring agencies.

2.4 WILDLIFE SURVEYS

2.4.1 General Inventory

Wildlife surveys consisted of walking meandering transects through the various habitats within the focused study area. Wildlife species were identified by direct observation and indirect sign including tracks, scat, calls, nests, and burrows. A wildlife species inventory was compiled for species encountered during the surveys and is included as Attachment B to this document.

2.4.2 Sensitive Wildlife Species

Least Bell's vireo (*Vireo bellii pusillus*), and southwestern willow flycatcher (*Empidonax traillii extimus*) data were acquired from Griffiths 1997, coastal California gnatcatcher (*Polioptila californica californica*) data from Griffiths 1994, and arroyo southwestern toad (*Bufo microscaphus californicus*) data from Holland 1997. Information about the Quino checkerspot butterfly (*Euphydryas editha quino*) was gathered from Redak et al. (1997) and Riverside fairy shrimp (*Streptocephalus woottoni*) and San Diego fairy shrimp (*Branchinecta sandiegoensis*) map data were obtained from MCB Camp Pendleton's digital files.

As part of the surveys for the original four alternative sites, portions of the study area in close proximity to the Santa Margarita River were walked to identify suitable breeding and dispersal habitat for the federally listed endangered arroyo southwestern toad. Similarly, these original sites were surveyed for the general suitability of habitat for the federally listed endangered Stephens' kangaroo rat (*Dipodomys stephensi*) and to identify potential presence of Pacific pocket mouse (*Perognathus longimembris pacificus*), another federally listed endangered species. Additionally, all stands of eucalyptus trees (*Eucalyptus* sp.) within the original focused study area were visited to look for the monarch butterfly (*Danaus plexippus*). As most of these areas are no longer alternatives of the proposed project, these surveys are no longer mentioned in this report.

Quino Checkerspot Butterfly Habitat Reconnaissance

Habitat for the federally listed endangered Quino checkerspot butterfly (*Euphydryas editha quino*) consists of vegetation communities with relatively open areas that typically include patches of dot-seed plantain (*Plantago erecta*), Island plantain (*Plantago ovata*), purple owl's clover (*Castilleja exserta*), and other nectar carrying plants. Host plant populations were observed during surveys at the Stuart Mesa Effluent Ponds site on March 11, 1998; this site is no longer considered as an

alternative of the proposed project. Host plant populations were not present on the AWT Facility nor the Equalization Basin sites, which are both immediately adjacent to STP 13.

3.0 EXISTING CONDITIONS

3.1 TOPOGRAPHY AND SOILS

The topography and soil types within the three sites (discussed below) varies considerably, since they are non-contiguous areas situated throughout the southwest portion of MCB Camp Pendleton.

3.1.1 Advanced Wastewater Treatment Facility and Equalization Basin

The AWT Facility site consists of a generally flat mesa adjacent to the east side of STP 13, and northwest of the Recycling Center. The equalization basin site occurs on the same mesa just south of the recycling center and north of the Base Commissary. The elevation of these sites ranges from approximately 40 to 45 feet above Mean Sea Level (MSL). The soils of both sites are sandy loams of the Visalia series (USDA 1973).

3.1.2 Sewage Treatment Plant 2

STP 2 occurs on the slopes above and to the west of Pilgrim Creek. The elevation of the site ranges from approximately 100 to 140 feet above MSL. Bonsall sandy loams and Tujunga sand are the soils onsite (USDA 1973).

3.1.3 Ysidora Flats Site

The Ysidora Flats site is located within the floodplain of the Santa Margarita River. The elevation of the site ranges from 25 to 30 feet above MSL. Greenfield sandy loams and Salinas clay are the soils onsite (USDA 1973).

3.2 VEGETATION

Vegetation types or communities and plant associations are assemblages of plant species that usually coexist in the same area. The classification of vegetation communities is based upon the life form of the dominant species within that community and the associated flora. Vegetation types were classified following the descriptions provided by Holland (1986), Oberbauer (1996), and Zedler, et al. (1997). In some instances, there may be an assemblage of plant species for which there is not an adequate description in these references; therefore, the term plant associations is preferred over vegetation communities. In each instance, a category was selected that reflected both the floristics

and physiognomy of the assemblage. Species names predominantly follow those of Hickman (1993), with occasional use of Beauchamp (1986), where necessary.

The existing plant associations occurring within the focused study area consist of the following community types: Diegan coastal sage scrub, southern coastal salt marsh, southern willow riparian forest, southern willow scrub, mule fat scrub, disturbed wetlands, non-native annual grassland, ruderal habitat, eucalyptus woodland/exotic trees, and developed/ornamental areas. These plant associations are generally described below and are shown in Figures 3 through 5.

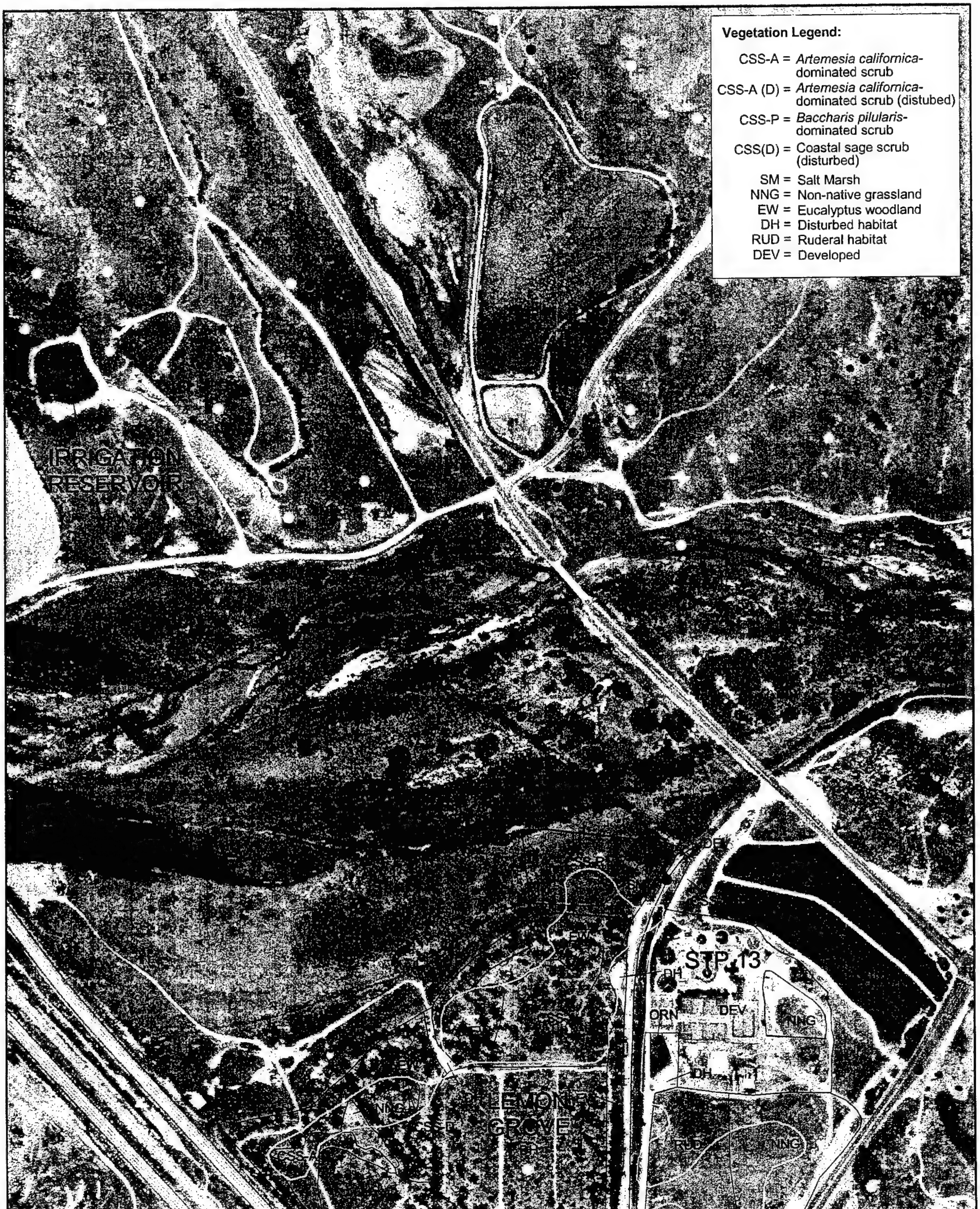
3.2.1 Plant Associations

Diegan Coastal Sage Scrub

Coastal sage scrub is one of the major shrub-dominated (scrub) communities within California. This community occurs on xeric sites with shallow soils. Sage scrub species are typically drought deciduous plants with shallow root systems. Both of these adaptations allow for the occurrence of sage scrub species on xeric sites.

There are four floristic associations within the coastal sage scrub formation, all occurring within distinct geographical ranges along the California coast. The Diegan association occurs from Orange County to northwestern coastal Baja California (O'Leary 1990). Oberbauer (1996) recognizes coastal and inland forms of this association.

Diegan coastal sage scrub may be dominated by a variety of different species depending upon site-specific topographic, geographic, and soil conditions. Within San Diego County, there are several recognized sub-associations of Diegan coastal sage scrub, with classifications based upon the dominant species. California sagebrush (*Artemisia californica*) dominated sage scrub and disturbed coastal sage scrub occur along the bluffs, north and northwest of the Lemon Grove ponds. Other species that were observed to be common within these sub-types include coastal goldenbush (*Isocoma menziesii* var. *vernonoides*), laurel sumac (*Malosma laurina*), Mexican elderberry (*Sambucus mexicana*), coastal prickly pear (*Opuntia littoralis*), and cane cholla (*Opuntia parryi* var. *parryi*).



Source: Base Aerial Coverage: Southwest Division
Vegetation Communities: KEA Environmental (1997-98)
SWWF and LBV Data: 1997 Griffith Data

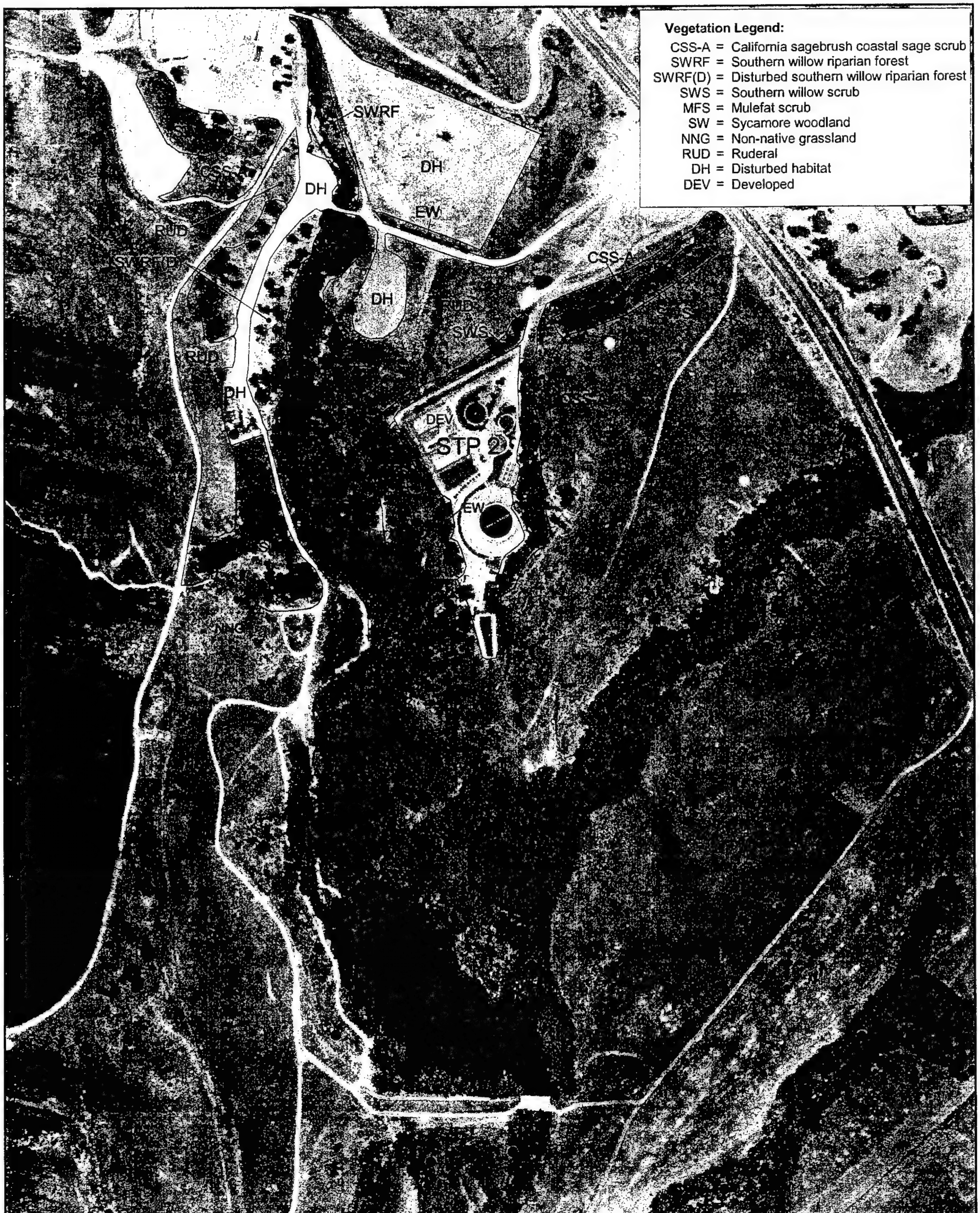
300 0 300 600 900 Feet

Sensitive Species
- Least Bell's Vireo Sighting
- Southwest Arroyo Toad Sighting
- Gnatcatcher Sighting (1994)
- Gnatcatcher Sighting (1997)

Vegetation Community Boundary
Survey Route

Figure 3
Vegetation & Sensitive Species for Lemon Grove

9416.6 P-527/GIS/9416.6 P-527 (Latest)/Figure 3.apr



Source: Base Aerial Coverage: Southwest Division
Vegetation Communities: P-527 FEIS/R, 1997
SWWF and LBV Data: 1997 Griffith Data

200 0 200 400 600 Feet

Sensitive Species
- Least Bell's Vireo Sighting
- Southwestern Willow Flycatcher Sighting
- California Gnatcatcher Sighting (1994)
- California Gnatcatcher Vocalization (1998)

Vegetation Community Boundary

Figure 4
Vegetation & Sensitive Species for STP 2

9416.6 P-527/GIS/9416.6 P-527 (Latest)/Figure 4.apr

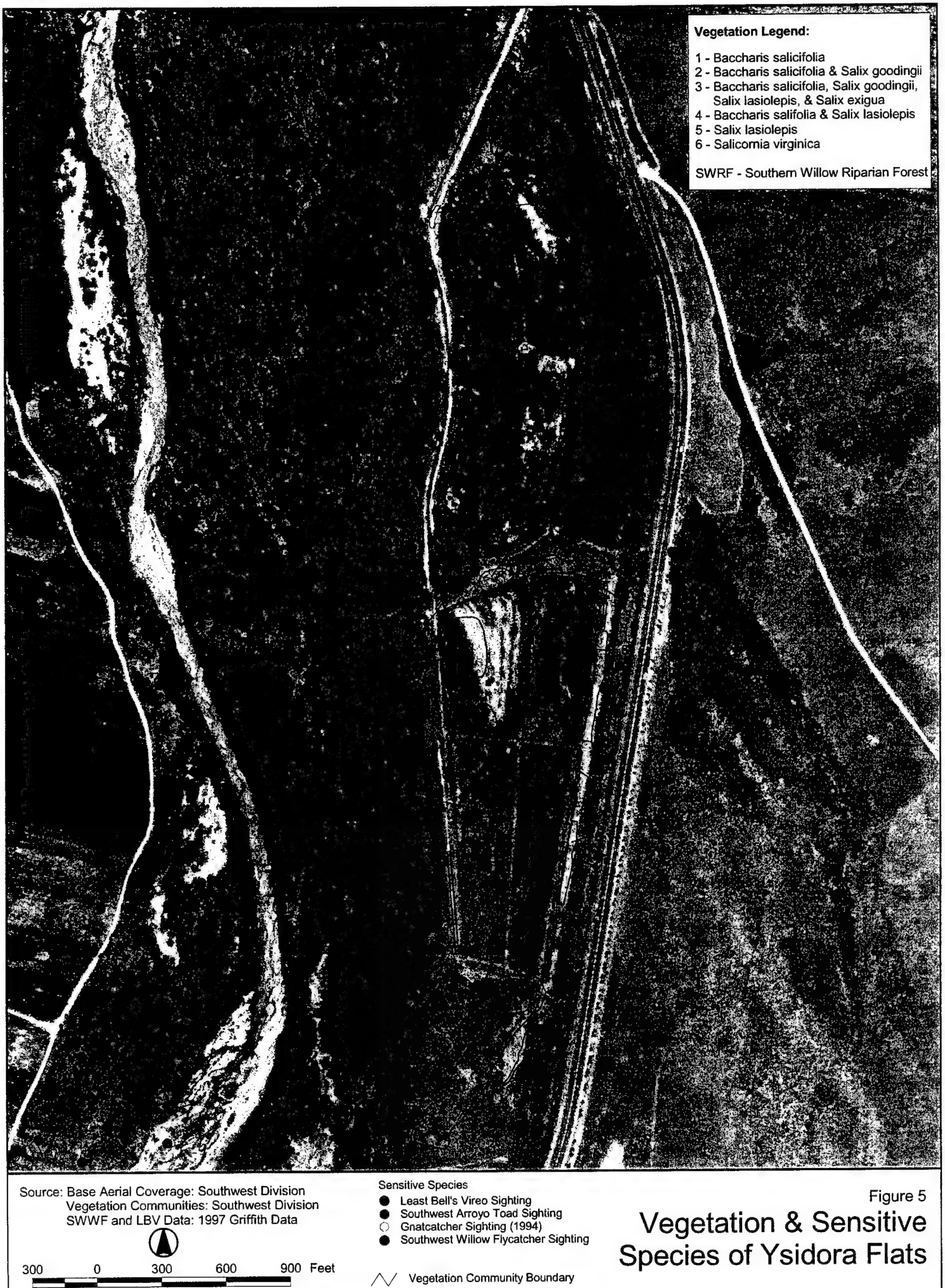


Figure 5
Vegetation & Sensitive Species of Ysidora Flats

9416.6 P-527/GIS/9416.6 P-527 (Latest)/Figure 5.apr

Riparian and Wetland Communities

Riparian communities occur along stream courses and drainages and are floristically and structurally distinct from the adjacent upland communities. Riparian communities may be floristically similar to each other, but may differ sufficiently in structure to warrant different classifications (forests, woodlands, scrub). Most of the dominant species in these communities require moist, bare mineral soils for germination and establishment, much like the conditions following periodic flooding (Holland 1986). Riparian and wetland communities that occur either on or adjacent to the project site(s) include southern willow riparian forest, southern willow scrub and mule fat scrub. The majority of these communities are dominated by willows (*Salix* sp.) and mulefat (*Baccharis salicifolia*). However, giant reed (*Arundo donax*), a noxious weed, is invading these native wetland communities, particularly within the Santa Margarita River watershed, displacing native plant and animal species, including sensitive species. Often, riparian and wetland communities are regulated by the USACOE if the three parameters, hydrology, hydric soils and hydrophytic vegetation, are present. These jurisdictional wetlands boundaries are determined through delineations pursuant to the USACOE 1987 Wetland Delineation Manual. The following discussion pertains to wetlands of undetermined jurisdictional status (biological wetlands).

Southern Willow Riparian Forest

Southern willow riparian forest is a tall, open forest that occurs along major streams and rivers. It is dominated by several willow species including: arroyo willow (*Salix lasiolepis*), Goodding's black willow (*Salix gooddingii*) and narrow-leaved willow (*Salix exigua*). Understory species such as mule fat, mugwort (*Artemisia douglasiana*), and stinging nettle (*Urtica dioica* ssp. *holosericea*), may also be present (Beauchamp 1986). This community occurs along Pilgrim Creek adjacent to the STP 2 site. It also surrounds the mitigation site for the BRAC and Levee projects along the Santa Margarita River within the former Ysidora Ponds. The Ysidora Flats site is located in the mitigation site. The mitigation for both projects includes onsite natural recruitment of native riparian vegetation, including southern willow riparian forest. The USACOE permit for the projects requires that natural recruitment of native riparian species and exclusion of exotic weeds be monitored for at least five years.

Southern Willow Scrub

Southern willow scrub is found on loose, sandy, or fine gravelly alluvium deposited near stream channels during floods. Most stands are too dense to allow much understory to develop. Southern willow scrub may represent a successional stage leading to riparian woodland or may be stable. This

community is generally dominated by arroyo willow and, occasionally, Goodding's black willow, narrow-leaved willow, and mule fat. This community currently occurs between Vandegrift Boulevard and the former Ysidora Ponds as well as on some of the former pond berms that remain after the ponds were removed for the BRAC mitigation project. Southern willow scrub had previously occurred in patches throughout the Ysidora Ponds site along the Santa Margarita River.

Mule Fat Scrub

Mule fat scrub is a riparian shrub community that is dominated by mule fat in association with arroyo willow and Goodding's willow. In the absence of frequent flooding and human-caused disturbance, this community may develop into a riparian woodland or forest (Holland 1986). This community is adjacent to the former Ysidora Ponds site, which is currently a mitigation site for the BRAC and Levee projects, and had occurred in some areas in the current mitigation site.

Southern Coastal Salt Marsh

Coastal salt marsh occupies wetland habitats that are subject to tidal influence and to varying degrees of freshwater input, primarily during the rainy season. Because of their coastal location they are also subject to salt spray. Salt marsh plants are mostly herbaceous perennials and low shrubs which are tolerant of both flooding and high salt content (Zedler et al. 1997). Coastal salt marsh plants are distributed along distinct zones depending upon such environmental factors as frequency and length of tidal inundation, salinity levels, and nutrient status (MacDonald 1977). The common species of the salt marshes of Camp Pendleton are: pickleweed (*Salicornia subterminalis*), (*S. virginica*), alkali heath (*Frankenia salina*) and salt grass (*Distichlis spicata*). The Santa Margarita River Estuary is the major salt marsh at Camp Pendleton covering approximately 159 acres (Zedler et al. 1997).

Disturbed Wetlands

Disturbed wetlands are communities that are dominated by exotic wetland species. These species invade sites that have been previously disturbed or are periodically disturbed. This perturbation regime has resulted in the displacement of native wetland species and the subsequent colonization of these areas by exotics. Disturbed wetlands onsite are dominated by cocklebur (*Xanthium strumarium* var. *canadense*), umbrella sedge (*Cyperus* sp.), and curly dock (*Rumex crispus*). Disturbed wetlands occur in some areas around the mitigation site at the former Ysidora Ponds and also between the former ponds and Vandegrift Boulevard.

Grassland Communities

Non-Native Annual Grassland

Most of the grasslands in the coastal and foothill areas of San Diego County are dominated by exotic annual grasses of Mediterranean origin. The factors that contributed to the replacement of native grasslands by non-native grasslands, are many. The Mediterranean region has a maritime climate similar to that of much of cismontane California. The Mediterranean region has a long history of agriculture and grazing activities and many of these introduced species are disturbance associated. Many of these species are thus pre-adapted to areas with similar climates and disturbance regimes. Intensive grazing and agriculture, accidental and intentional species introductions, along with some severe droughts during the early Spanish Era, allowed for the successful invasion of these exotic species and the subsequent displacement and exclusion of native grasses. It was initially believed that over-grazing was the principle factor in the displacement of native grasses but there is considerable current debate over this. This association may have replaced native grassland and coastal sage scrub, as evidenced at many localities throughout San Diego County. Wild oats (*Avena barbata*) was the only grass species identifiable at the time of the survey within all the grasslands surveyed, but other exotic grass species such as red brome (*Bromus madritensis* ssp. *rubens*), ripgut grass (*Bromus diandrus*), and foxtail fescue (*Vulpia megalura*) are expected to locally dominate this community onsite. Characteristic forbs include sweet fennel (*Foeniculum vulgare*), red-stemmed filaree (*Erodium cicutarium*), and mustard (*Hirschfeldia incana*).

Ruderal

Areas of high and frequent soil disturbance that are generally bare or are dominated by non-native weedy forbs (herbaceous, non-grass species) that are adapted to a regime of frequent disturbances are classified as ruderal. Ruderal areas onsite consist of disturbed lands that have been completely invaded by weedy forbs (most abundantly, sweet fennel). Many of the species characteristic of ruderal areas are also indicator species of annual grasslands. Telegraph weed (*Heterotheca grandiflora*), mustard, sweet fennel, deer weed (*Lotus scoparius*), and red-stemmed filaree are the dominant species within the ruderal areas onsite.

Eucalyptus Woodland/Exotic Trees

This community is dominated by several species of eucalyptus. These introduced tree species produce large amounts of leaf and bark litter, the chemical composition of which inhibits the establishment of other species, especially natives, in the understory. Generally, these species were

planted for aesthetic and horticultural purposes, but many species of eucalyptus have become naturalized and have been quite successful in invading riparian areas.

Developed/Ornamental Areas

Developed/ornamental plant associations can be found in those portions of the study area that have been developed and support structures or that have been planted with ornamentals, such as at STP 2.

3.2.2 Plant Associations at the Five Alternative Sites and Pipelines

This section provides site-specific information about the plant associations described above including acreages and locations within the focused study area.

Advanced Wastewater Treatment Facility and Equalization Basin

The AWT site is developed with 0.4 acre of ornamentals and 0.6 acre of non-native grassland. The 1.0 acre Equalization Basin study area is entirely located within non-native grassland (see Figure 3). The proposed AWT facility at STP 13 is a component of Alternatives 3, 4 and 5. The proposed equalization basin at STP 13 is a component of Alternatives 4 and 5.

Sewage Treatment Plant 2

The STP 2 study area covers 1.0 acre of ruderal habitat within an existing developed area. The proposed site is adjacent to southern willow riparian forest and mulefat scrub habitat along Pilgrim Creek (see Figure 4). The proposed equalization basin and tertiary treatment facility at STP 2 are components of Alternative 2. Ruderal and disturbed habitat covers most of the proposed ten-inch force main pipeline route.

Ysidora Flats

Two sets of percolation ponds at Ysidora Basin, the Ysidora Ponds, were previously located along the Santa Margarita River between the river and Vandegrift Boulevard (see Figure 5). Floods in 1993 breached the pond berms in several places. Subsequently, riparian vegetation became established on the site on which the ponds were located. The previously noted BRAC and Levee projects resulted in impacts to jurisdictional wetlands and riparian habitats. To mitigate for these impacts, wetlands are being created within the area of the former Ysidora Ponds. The pond berms that were breached in 1993 were partly removed in 1997 to re-establish the natural floodplain of the

Santa Margarita River. While the mitigation site for the BRAC project is currently (1998) in its first monitoring year, the Levee project mitigation acreage has not yet been formally allocated; a mitigation plan is currently being prepared by the Marine Corps. According to permits issued by the USACOE on February 25, 1997 for the BRAC project, and on April 6, 1998 for the Levee project, mitigation objectives are as follows:

- create riparian habitat and jurisdictional wetlands by establishing appropriate hydrologic regimes and opportunity for natural recruitment of riparian vegetation;
- for five years after initiation of mitigation monitoring, control the invasion of noxious weeds (as specified in the USACOE permit), monitor the recruitment of native riparian vegetation and avifauna, and monitor hydrology and nutrient content; and
- by the end of the fifth monitoring year and for an additional twelve consecutive months, the site shall contain less than five percent relative cover of exotic species.

3.3 WILDLIFE

A total of 45 animal species were detected during previous surveys within the study area, including one invertebrate species, one amphibian species, two reptile species, 37 bird species, and four mammal species (Attachment B).

3.3.1 Advanced Wastewater Treatment Facility

Bird species observed in the non-native grassland onsite include killdeer (*Charadrius vociferus*) and house finch (*Carpodacus mexicanus*).

3.3.2 Sewage Treatment Plant 2 Site

This site is mainly developed. However, surrounding coastal sage scrub habitats could support several bird species including Bewick's wren (*Thryomanes bewickii*), white-crowned sparrow (*Zonotrichia leucophrys*), yellow-rumped warbler (*Dendroica coronata*), and California towhee (*Pipilo crissalis*). Birds associated with the eucalyptus woodland onsite include red-tailed hawk (*Buteo jamaicensis*) and house finch. Surrounding riparian habitats are utilized by bird species such as black phoebe (*Sayornis nigricans*), song sparrow (*Melospiza melodia*) and common yellowthroat (*Geothlypis trichas*).

3.3.3 Ysidora Flats Site

Avian species that could potentially occur in riparian habitats onsite include song sparrow, yellow-rumped warbler, common yellowthroat, Hutton's vireo (*Vireo huttoni*), belted kingfisher (*Ceryle alcyon*), and great horned owl (*Bubo virginianus*), among others. Mammals likely to frequent the riparian forest habitats onsite include Virginia opossum (*Didelphis marsupialis*), dusky-footed woodrat (*Neotoma fuscipes*), mule deer (*Odocoileus hemonus*), and raccoon (*Procyon lotor*).

3.4 SENSITIVE BIOLOGICAL RESOURCES

The study area was evaluated for the extent, quality, and significance of existing sensitive biological resources.

3.4.1 Sensitive Plant Species

Sensitive plants include those listed by the USFWS (1997a, 1997b), California Department of Fish and Game (CDFG) (1997a), and those plant species designated as rare, threatened, or endangered in California and elsewhere (List 1B species) by the California Native Plant Society (CNPS) (Skinner and Pavlik, 1994). No sensitive species were observed on the AWT Facility/Equalization Basin site and due to the lack of native habitat on this site, no sensitive plant species are expected to occur there. No sensitive plant species were found at the STP 2 and Ysidora Flats sites during surveys for the FEIS/R.

Table 2 lists the more highly sensitive plant species known to occur on Camp Pendleton, if there is appropriate habitat within a study area, along with their sensitivity status and comments on their potential for occurrence onsite (see the footnotes to Table 2 for an explanation of the USFWS, CDFG, and CNPS designations).

3.4.2 Sensitive Animal Species

Sensitive animal species are those listed by the USFWS (1996a, 1997a, 1997b) and those listed by the CDFG (1997b) as sensitive for the reasons described earlier. The USFWS officially lists sensitive species as either threatened or endangered and, unofficially, lists other sensitive species as Federal Species of Special Concern.

Table 2
Listed and Sensitive Species with Known or Potential Occurrence on or Adjacent to the P-527B Sewage Effluent Compliance Study Area

Species Name	USFWS Status*	CDFG Status*	Other*	On-Site Occurrence or Potential
Plants				
Thread-Leaved Brodiaea (*Brodiaea filifolia*)	T	E	CNPS 1B, 3-3-3	This species is known to occur on Camp Pendleton. Thread-leaved brodiaea has a low potential to occur in the grasslands of the Lemon Grove study area due to the lack of clay soils. Spring surveys are needed to determine presence or absence of this species onsite.
Orcutt's Brodiaea (*Brodiaea orcuttii*)			CNPS 1B, 1-3-2	This species has recently been reported on Camp Pendleton [north of the 25 Area, south of Kilo 2 (KEA 1998)]. Orcutt's brodiaea has a low potential to occur within the Lemon Grove study areas in vernally moist grasslands, swales, or streamside habitat.
Blochman's Dudleya (*Dudleya blochmaniae* ssp. *blochmaniae*)			CNPS 1B, 2-2-2	Known to occur on Camp Pendleton. This species occurs in sandy openings of coastal sage scrub near the coast. This species has a moderate potential for occurrence in the undisturbed sage scrub on the Lemon Grove study area, but was not observed during the survey.
Many-Stemmed Dudleya (*Dudleya multicaulis*)			CNPS 1B, 1-2-3	Known to occur on Camp Pendleton. This species occurs in openings of the ecotonal transitional areas between sage scrub and grasslands. This species has a moderate potential for occurrence in the undisturbed sage scrub on the Lemon Grove study area, but was not observed during the survey.
Coast Wallflower (*Erysimum ammophilum*)			CNPS 1B, 2-2-3	Known to occur on Camp Pendleton. The taxonomy of this entity in San Diego County is uncertain (i.e. populations previously identified as this species may be *E. capitatum*). Populations of this species have been previously identified in close proximity to the Lemon Grove study area. This "species" would have a high potential for occurrence within the undisturbed sage scrub of this study area, but was not observed during the survey.
Southwestern Spiny Rush (*Juncus acutus* ssp. *leopoldii*)			CNPS 4, 1-2-1	This species is known to occur on Camp Pendleton at the mouth of the Santa Margarita River Estuary.
Del Mar Sand Aster (*Lessingia filaginifolia* var. *linifolia*)			CNPS 1B, 3-2-3	Known to occur on Camp Pendleton. This species occurs in sandy coastal areas (both disturbed and chaparral habitats). Del Mar sand aster was not observed during the surveys and is expected to have a low potential for occurrence in the sandy areas of the study areas.
Cleveland's Goldenstar (*Muilla clevelandii*)			CNPS 1B, 2-2-2	This species is not reported to occur on Camp Pendleton. Cleveland's goldenstar occurs in grasslands and adjacent to vernal pools in areas of clay substrates. This species has a low potential for occurrence within the Lemon Grove study area, but was not observed during the survey.
Fish				
Tidewater Gody (*Eucyclogobius Newberryi*)	E			This species is historically known from the Santa Margarita River Estuary, but has not been reported from there since 1991.
Invertebrates				
Monarch Butterfly (*Danaus plexippus*)		SA-Over-wintering		Observed approximately 50 individuals airborne within the eucalyptus woodland at the Lemon Grove site.
Quino Checkerspot Butterfly (*Euphydryas editha quino*)	E			Not known to occur on Camp Pendleton.
Riverside Fairy Shrimp (*Streptocephalus woottoni*)	E			Known to occur on Camp Pendleton in vernal pools.
San Diego Fairy Shrimp (*Branchinecta sandiegoensis*)	E			Known to occur on Camp Pendleton in vernal pools.

Species Name	USFWS Status*	CDFG Status*	Other*	On-Site Occurrence or Potential
Amphibians				
Arroyo Southwestern Toad (*Bufo microscaphus californicus*)	E	SSC		Known to occur on Camp Pendleton within the Santa Margarita River basin.
Birds				
Golden Eagle (*Aquila chrysaetos*)	BEPA	SSC		Although no golden eagles were observed within the study area, the species may occasionally forage in the grassland habitats onsite. No nesting is expected in the project vicinity.
Coastal California Gnatcatcher (*Polioptila californica californica*)	T	SSC		One pair of gnatcatchers was observed in the coastal sage scrub at the Lemon Grove site immediately north of the ponds. A single gnatcatcher was heard in the coastal sage scrub patch to the west of the terminus of the ten-inch force main pipeline route. Another possible gnatcatcher was heard in the drainage northeast of STP 2.
Least Bell's Vireo (*Vireo bellii pusillus*)	E	E		Known to occur at Camp Pendleton. Current data indicate that least Bell's vireo occupy the narrow band of southern willow scrub adjacent to the north end of the Lemon Grove site. This species is also known to occur in the Santa Margarita River at Ysidora Flats adjacent to the outfall facility and along Pilgrim Creek adjacent to STP 2 and the proposed ten-inch force main pipeline route.
Southwestern Willow Flycatcher (*Empidonax traillii extimus*)	E			This species is known to occur in the Santa Margarita River at Ysidora Flats adjacent to the outfall facility.
Great Blue Heron (*Ardea herodias herodias*)		SA-Rookery	Everett-S	No suitable nesting habitat occurs within the study area.
Turkey Vulture (*Cathartes aura*)			Everett-D	One turkey vulture was observed circling over the Lemon Grove site, where it likely forages for carrion.
Osprey (*Pandion haliaetus*)		SSC-Breeding		Not likely to nest within the study area due to a lack of suitable habitat.
White-tailed Kite (*Elanus coeruleus majusculus*)		SA-Nesting		Observed at the Lemon Grove site. Not likely to nest within the study area due to a lack of appropriate habitat.
Loggerhead Shrike (*Lanius ludovicianus*)		SSC		One loggerhead shrike was observed in the ruderal habitat at the south end of the Lemon Grove site.

*Status Codes:
- U.S. Fish and Wild Service (USFWS)
  - E = Endangered; T = Threatened; PE = Proposed Endangered; PT = Proposed Threatened; BEPA = Protected under Bald Eagle Protection Act
- California Department of Fish and Game (CDFG)
  - E = Endangered; T = Threatened; FP = Fully Protected; SA = Special Animal; SSC = Species of Special Concern
- California Native Plant Society (CNPS) (Skinner and Pavlik 1994)
  - List 1B - Plants rare and endangered in California and elsewhere
- CNPS R-E-D Code
  - R (Rarity): 1 = Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction or extirpation is low at this time; 2 = Occurrence confined to several populations or to one extended population; 3 = Occurrence limited to one or a few highly restricted populations, or present in such numbers that it is seldom reported
  - E (Endangerment): 1 = Not endangered; 2 = Endangered in a portion of its range; 3 = Endangered throughout its range
  - D (Distribution): 1 = More or less wide spread outside California; 2 = Rare outside California; 3 = Endemic to California
- Everett-D = Declining
- Everett-S = Sensitive

Several sensitive animal species were observed onsite or are known from immediately adjacent to the site(s). The sensitive wildlife species observed, or that have a potential for occurrence onsite, are listed in Table 2 along with their sensitivity status and comments on their distribution (see the footnotes to Table 2 for an explanation of the sensitivity designations). These federally listed species are discussed below.

Sensitive Animal Species Observed or Potentially Occurring Within the Study Areas

Federally Sensitive Species Observed (December 1997)

Coastal California Gnatcatcher - *Polioptila californica californica*

USFWS Status:	Threatened
Listing Data:	The coastal California gnatcatcher was listed by the USFWS on 30 March 1993 (Federal Register 58 FR 16757). This listing status applies to the entire population of *P. c. californica*. Critical habitat has not been determined by the USFWS and there is no approved recovery plan for the species.
Distribution:	The coastal California gnatcatcher is believed to be extirpated from San Bernardino County and is declining proportionately with the continued loss of coastal sage scrub habitat located within the coastal plain in the five remaining southern California counties (Ventura, Los Angeles, Orange, San Diego, and Riverside).
Habitat:	Habitat preferences in San Diego County consist of Diegan coastal sage scrub dominated by California sagebrush (*Artemisia californica*) and flat-topped buckwheat (*Eriogonum fasciculatum*), which are the primary plants used by gnatcatchers when foraging for insects (RECON 1987; ERCE 1990). It inhabits coastal sage scrub vegetation below 760 meters (2,500 feet) elevation in Riverside County and generally below 300 meters (1,000 feet) elevation along the coastal slope; and generally avoids steep slopes above 25 percent and dense, tall vegetation for nesting.
Natural History:	The subspecies is a local and uncommon year-round resident of southern California with a breeding season that extends from 1 February through 15 July. The territory size requirements of the coastal California gnatcatcher varies with habitat quality. Documented home ranges have varied from 2 to 18 hectares (6 to 45 acres) in San Diego County (RECON 1987; ERCE 1990).
Comments:	The United States coastal California gnatcatcher population is estimated between 1,800 and 2,500 pairs remaining in southern California (Atwood

1992, USFWS 1994). The primary cause of this subspecies' decline is the cumulative loss of coastal sage scrub vegetation to urban and agricultural development. Little of this subspecies' habitat is formally protected or managed. Initial studies suggest that the coastal California gnatcatcher may be highly sensitive to the effects of habitat fragmentation and development activity (Atwood 1990; ERCE 1990). The USFWS has estimated that coastal sage scrub habitat has been reduced by 70 to 90 percent of its historical extent (USFWS 1991) and little of what remains is protected in natural open space.

Status on Site: One pair of coastal California gnatcatchers was observed in the sage scrub immediately north of the Lemon Grove Ponds. Base-wide data indicate that the coastal sage scrub north and east of the site has supported the species. Base-wide data also indicate that this species occurs east and west of STP 2 (Griffith Wildlife Biology 1994). A single gnatcatcher was heard in the coastal sage scrub patch to the west of the terminus of the ten-inch force main pipeline route. Another possible gnatcatcher was heard in the drainage northeast of STP 2.

Federally Sensitive Species Potentially Occurring (Within Known Range/Habitat Type)

Arroyo Southwestern Toad - *Bufo microscaphus californicus*

USFWS Status: Endangered

Listing Data: The arroyo southwestern toad was listed by the USFWS on 16 December 1994 (Federal Register 59 FR 64866). This listing status applies to the entire population of arroyo southwestern toad. Critical habitat has not been determined by the USFWS, and there is no approved recovery plan for the subspecies.

Distribution: Found in the semiarid parts of the southwest from near Santa Margarita in San Luis Obispo County to northwestern Baja California.

Habitat: This subspecies of southwestern toad is typically associated with gravelly or sandy washes, stream and river banks, and arroyos. Adult toads spend most of the year in burrows in upland habitat near washes and streams. Non-breeding habitat includes sage scrub, mixed chaparral, Joshua tree woodland, and sagebrush habitats.

Natural History: Breeding activity has been observed from February to June depending on temperatures and precipitation (Sullivan 1992; Sweet 1993). Breeding occurs in quiet, clear backwaters of streams as waters recede from the floods of the wet season. Males call from suitable breeding habitat at night. The call is a

musical trill heard in 10 second bursts. Eggs are laid on the bottom of the shallow pools, usually in tangled strings of 1-3 rows. The eggs are sensitive to siltation and require good water quality. Because the eggs are laid in very shallow water and are not anchored or attached, rapid changes in stream flow can leave the eggs dry or wash them away. The tadpoles reach a maximum length of about 4.0 centimeters (1.5 inches) and are solitary and extremely cryptic, typically mottled or spotted with blackish to brown colors. Juvenile toads bask during the day on sandy or gravelly beaches in the late summer before beginning the subterranean life of the adults. The adults spend the majority of the year in burrows and are nocturnal and can occasionally be found at night foraging on open, sandy areas around the drainage.

Comments: An estimated 75 percent of the historical habitat of the species has been destroyed and many of the remaining populations are threatened. The primary reasons for the decline of the species include dams and water projects, urban development, agriculture and grazing, and human recreational activities in breeding areas.

Status on Site: The arroyo southwestern toad is known from the Santa Margarita River Basin and from upland locations north of the Santa Margarita River Basin near Stuart Mesa. The arroyo southwestern toad is not known from Ysidora Flats nor has it been reported from Pilgrim Creek near STP 2 as described in the FEIS/R.

Least Bell's Vireo - *Vireo bellii pusillus*

USFWS Status: Endangered

Listing Data: The least Bell's vireo was listed by the USFWS on 2 May 1986 (Federal Register 51 FR 16482), with a critical habitat listing. This listing status applies to the entire population of least Bell's vireo. No recovery plan has been approved for the species.

Distribution: Historically this subspecies was a common summer visitor to riparian habitat throughout much of California. Currently, least Bell's vireo is found only in riparian woodlands in southern California, with the majority of breeding pairs in San Diego, Santa Barbara, and Riverside Counties. Substantial vireo populations are currently found on five rivers in San Diego County (Tijuana, Sweetwater, San Diego, San Luis Rey, and Santa Margarita), with smaller populations on other drainages. Over 460 breeding pairs or territorial males were recorded in San Diego County in 1991 (Salata, pers. comm.).

Habitat: Least Bell's vireo is restricted to riparian woodland and is most frequent in areas that combine an understory of dense young willows or mulefat with a canopy of tall willows. Since the vireos build their nests in dense shrubbery 1 to 1.2 meters (3 to 4 feet) above the ground (Salata 1984), they require young successional riparian habitat or older habitat with a dense understory. Therefore, riparian plant succession is an important factor maintaining vireo habitat. Also, nests are often placed along internal or external edges of riparian thickets (USFWS 1986).

Natural History: The least Bell's vireo arrives in San Diego County in late March and early April and leaves for its wintering ground in September.

Comments: The vireo's decline is due to loss, degradation, and fragmentation of riparian habitat combined with nest parasitism by the brown-headed cowbird.

Status on Site: Current Base-wide least Bell's vireo survey results indicate that the species occupy suitable nesting habitat immediately adjacent to the Lemon Grove site in the narrow strip of southern willow scrub west of the Twin Lakes Reservoirs and east of the proposed seasonal discharge pipeline turnout area (Griffith Wildlife Biology 1997). The Base-wide study also indicates that least Bell's vireo occupy habitat along Pilgrim Creek immediately east of STP 2 and along the Santa Margarita River at Ysidora Flats as described in the FEIS/R.

Southwestern Willow Flycatcher - *Empidonax traillii extimus*

USFWS Status: Endangered

Listing Data: The southwestern willow flycatcher was listed by the USFWS on 27 February 1995 (Federal Register 60 FR 10715). This listing applies to the entire population of *E. t. extimus*. Critical habitat for the subspecies was determined by the USFWS on 16 July 1997 (Federal Register 62 FR 39129), and corrected on 20 August 1997 (Federal Register 62 FR 44228) regarding critical habitat on MCB Camp Pendleton. No approved recovery plan has been adopted for the southwestern willow flycatcher.

Distribution: This subspecies of willow flycatcher is a summer breeding resident in riparian habitats in southern California, southern Nevada, southern Utah, Arizona, New Mexico, western Texas, southwestern Colorado, and northwestern Mexico (USFWS 1995a). In San Diego County only two substantial breeding populations are known to remain along the Santa Margarita River and the upper San Luis Rey River.

Habitat: It is restricted to dense riparian woodlands of willow, cottonwood, and other deciduous shrubs and trees. In general, the riparian habitat of this subspecies tends to be rare, isolated, small and/or in linear patches, separated by vast expanses of arid lands.

Natural History: Spring migration of the endangered subspecies is relatively late, beginning in early May and extending through June (Unitt 1984). Fall migration of the subspecies occurs rather early, from August through mid-October. Egg laying by the endangered southwestern willow flycatcher occurs in San Diego County from the end of May through the end of June. Dense willow thickets are required for nesting and nests are often near standing water (CDFG 1990). Willow flycatchers hunt for insects from low exposed perches, flying out to catch the insects in mid-air.

Comments: The southwestern willow flycatcher was listed as endangered by the USFWS in February 1995 because of "extensive loss of riparian breeding habitat, brood parasitism by the brown-headed cowbird *(Molothrus ater)*, and lack of adequate protective regulations" (USFWS 1995a). This subspecies was previously listed as endangered by the CDFG in December 1990. The population of southwestern willow flycatcher in southern California was estimated to be less than 80 pairs in the early 1980's (Unitt 1984).

Status on Site: The southwestern willow flycatcher is known from the Santa Margarita River immediately west of the Ysidora Flats site and is documented in the FEIS/R. This species is also known from Pilgrim Creek, south of STP 2 (Griffith Wildlife Biology 1997).

Non-Federally Sensitive Species

Loggerhead Shrike - *Lanius ludovicianus*

CDFG Status: Species of Special Concern

Distribution: The loggerhead shrike is distributed throughout North America.

Habitat: It occupies a variety of habitats, occurring wherever bushes or trees are scattered on open ground, and is found in all but the mountain areas of San Diego County.

Natural History: This is a fairly common breeding species in the county.

Status on Site: One loggerhead shrike was observed perched in the ruderal habitat on the south end of the Lemon Grove site. This species would be expected to forage over the non-native annual grasslands of STP 13.

3.4.3 Sensitive Habitats

Sensitive habitats are those which are considered rare within the region or support sensitive plants or animals. The sensitive habitats on or immediately adjacent to the three sites are: Diegan coastal sage scrub, and riparian and wetland habitats (i.e., southern coastal salt marsh, southern willow riparian forest, southern willow scrub, mule fat scrub, disturbed wetlands). Riparian and wetland habitats would only be considered sensitive if these communities would qualify as wetlands under the USACOE jurisdiction (if they meet the required hydrological, vegetation, and soil criteria).

Coastal Sage Scrub

Coastal sage scrub habitat on Camp Pendleton is considered sensitive if it is occupied by the federally threatened coastal California gnatcatcher. Oberbauer and Vanderwier (1991) estimate that only about 56,000 hectares (130,000 acres) of sage scrub remain in San Diego County. This represents a 69 percent loss of this community in the County from the pre-European era. These estimates were based on 1988 vegetation coverage estimates and additional losses have accrued since. Loss of sage scrub within California is due primarily to grazing and urbanization.

Riparian and Wetland Habitats

Riparian communities are situated along stream courses and adjacent to stream banks. Riparian communities contain wetland habitats which are defined by specific hydrological, vegetation, and soil criteria. Wetland habitats are under the jurisdiction of the USACOE pursuant to Section 404 of the Clean Water Act of 1972, as amended in 1977 and 1984.

Wetlands serve many functions including flood and sediment control, habitat for rare and common species, corridors for wildlife movement, and control of water quality and erosion. Oberbauer and Vanderwier (1991) report a reduction of 68 percent in coastal salt marsh (330 hectares [810 acres] from an original estimate of 8,377 hectares [20,700 acres]); and a reduction of 61 percent in riparian woodland (5,500 hectares [13,600 acres] from an original estimate of 14,000 hectares [34,600 acres]) in San Diego County since the pre-European era.

The loss and degradation of the riparian and wetland communities in southern California is the result of a variety of activities including the filling and draining of these habitats, clearing of riparian vegetation, water diversion and impoundment projects, grazing, channelization, increased erosion and sediment transportation, increased urban runoff, alteration of nutrient status, lowering of water

tables, contamination by agricultural fertilizer and pesticide use, human recreational activities, sand and gravel mining, and the invasion of exotic species (Bowler 1990; Ferren 1987).

4.0 POTENTIAL EFFECTS

Biological resources may be either directly or indirectly impacted by a project. These impacts are defined below.

Permanent: Occur when impacts result in the irreversible removal of biological resources. Examples include constructing a building or permanent road on an area containing biological resources.

Temporary: Occur when impacts are considered to have reversible effects on biological resources. Examples include generation of fugitive dust during construction; or removal of vegetation for underground pipeline trenching activities, and allowing the natural vegetation to recolonize the impact area.

Direct: Occur when biological resources are altered, disturbed, or destroyed during project implementation. Examples include clearing vegetation, encroaching into wetlands, diverting surface water flows, and the loss of individual species and/or their habitats.

Indirect: Occur when project-related activities affect biological resources in a manner that are not direct. Examples include elevated noise and dust levels, soil compaction, increased human activity, decreased water quality, and the introduction of invasive wildlife (domestic cats and dogs) and plants.

For purposes of this impact analysis, a worst-case scenario was assumed in the absence of detailed project plans. It was assumed that all biological resources within the study area would be potentially directly impacted. Indirect impacts may potentially occur to biological resources adjacent to the study area.

4.1 DIRECT IMPACTS

Direct impacts to the vegetation communities within each study area are summarized below.

4.1.1 Alternative 1: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains

This alternative would use the 22-acre ponds at Lemon Grove and the pipelines and pump stations designed to convey secondary effluent from STPs 1, 2, 3, 8 and 13 to the ponds. The ponds at Lemon Grove are currently under construction. An array of cased vertical drains would be constructed within the Lemon Grove ponds in order to discharge the treated effluent to the groundwater

Vegetation Communities

Because the ponds at Lemon Grove are currently under construction as described in the FEIS/R, there would not be any additional direct impacts to vegetation communities from this alternative.

Sensitive Plant Species

Because the ponds at Lemon Grove are currently under construction as described in the FEIS/R, there would not be any additional direct impacts to sensitive plants from this alternative.

Sensitive Animal Species

Since the ponds at Lemon Grove are currently under construction as described in the FEIS/R, there would not be any additional direct impacts to sensitive animal species (e.g., the coastal California gnatcatcher) from this alternative.

4.1.2 Alternative 2: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains plus Advanced Wastewater Treatment and Reclamation of a Portion of the Effluent (Preferred Alternative)

This alternative would be implemented in two phases. Phase 1 would provide the system of basins at the Lemon Grove site as described in the FEIS/R and for Alternative 1. Phase 2 would include the construction of an equalization basin and a tertiary treatment facility, both at STP 2, and a valve in the Headquarters West pipeline to enable future delivery of the advanced treatment effluent to the BRAC and Levee wetland mitigation site should it be needed in the future for groundwater recharge to enhance wetland revegetation efforts. In addition, a pipeline would be constructed to connect the STP 1 effluent pipeline west of STP 2, with the new equalization basin within STP 2. The pipeline would connect the existing ten-inch force main pipeline at Lima Road to STP 2 at the southern end

of the Rodeo Grounds and would be installed by directional drilling beneath the existing culverts in Pilgrim Creek in order to minimize disturbance to the creek.

Vegetation Communities

Development of Phase 1 of Alternative 2 would not result in impacts to vegetation communities. Phase 2 would directly impact approximately 1.0 acre of ruderal habitat from the construction of an equalization basin and an advanced wastewater treatment facility, both at STP 2. The proposed dechlorination facility would be within the disturbed area at STP 2. Therefore, no additional impacts to habitat would occur from this facility.

The new connection from the existing STP 1 pipeline would be trenched from the southern end of the Rodeo Grounds to STP 2. The ten-inch force main pipeline would cross Pilgrim Creek at the north end of STP 2 where three 48-inch diameter culverts are located within the creek. No wetland vegetation occurs within the boundaries of the dirt road which presently crosses the creek at the existing culverts. The ten-inch force main is to be trenched and directionally drilled approximately eight feet beneath the surface of the dirt road to avoid any impacts to sensitive vegetation.

For purposes of this analysis it is assumed that a disturbance width of up to 40 feet would be necessary for most of the route. It is also assumed that this 40-foot wide disturbance width would not be required at the existing Pilgrim Creek road crossing, thus avoiding impacts to the riparian forest. Additionally, it is assumed that along the southwestern border of STP 2, the pipeline could be constructed from STP 2 by temporarily removing the boundary fence. By constructing this portion of the pipeline from STP 2 additional impacts to mulefat scrub would be avoided. Under this scenario, approximately 1.3 acres of disturbed and ruderal habitat and 0.02 acre of mulefat scrub would be temporarily impacted by the pipeline. It is assumed over a short amount of time that these communities would recover to their former state. None of these temporary impacts would be significant.

Construction of a valve in the existing pipeline adjacent to Ysidora Flats would not impact any habitat as no construction of an outfall is proposed by Alternative 2. Should an outfall subsequently be constructed at Ysidora Flats, the added effluent surplus could potentially have an impact on the recruited riparian vegetation within the mitigation area. The added water could potentially create freshwater marsh habitat in the mitigation area or convert recruited riparian habitat into freshwater marsh. According to USACOE permits for the BRAC and Levee projects, only successful recruitment of wetlands and riparian habitats are considered acceptable impact mitigation.

Sensitive Plant Species

There would not be any direct impacts to sensitive plant species from Alternative 2 because no sensitive plant species were identified at the Lemon Grove pond site and no sensitive plant species were previously identified at STP 2.

Sensitive Animal Species

No sensitive animal species have been identified at STP 2 as described in the FEIS/R. As such, there would not be any direct impacts to sensitive animal species from that portion of Phase 2 built at STP 2. No direct impacts would occur from construction of the dechlorination facility, because the facility would be sited within disturbed habitat at STP 2. No direct impacts to sensitive animal species would occur from the construction of the ten-inch force main line, provided that trenching and directional drilling across Pilgrim Creek at the existing road crossing occur outside of the breeding season of the least Bell's vireo and the southwestern willow flycatcher avoiding direct impacts to potential nesting birds near the road crossing. The 0.02 acre of mulefat scrub that will be impacted by the pipeline is not considered adequate breeding habitat for any sensitive animal species.

4.1.3 Alternative 3: Tertiary Treated Effluent Blended with Secondary Effluent for Groundwater Recharge at Ysidora Flats

A tertiary treatment facility would be constructed at STP 13. Tertiary treated effluent would be discharged to the Ysidora Flats area to provide recharge to the groundwater and irrigation of riparian vegetation.

Vegetation Communities

Construction of the tertiary treatment plant at STP 13 would impact 0.6 acre of non-native grassland and 0.4 acre of developed area. These impacts would not be significant. Construction of the outfall at Ysidora Flats would not permanently impact any habitat as the existing pipe would be used to convey effluent. The outfall structure would be placed in the disturbed area of Ysidora Flats to avoid impacts to riparian vegetation. However, the added effluent surplus could potentially have an impact on the recruited riparian vegetation within the mitigation area. The added water could potentially create freshwater marsh habitat in the mitigation area or convert recruited riparian habitat into freshwater marsh. According to USACOE permits for the BRAC and Levee projects, only successful recruitment of wetlands and riparian habitats are considered acceptable impact mitigation.

Multiple discharge points would be installed to dissipate effluent over a larger area and avoid scour impacts to the mitigation area. This potential significant impact would be monitored.

Sensitive Plant Species

No sensitive plant species were previously identified within the Lemon Grove ponds in the FEIS/R. No sensitive plant species were identified during the survey of STP 13 and none would be expected to occur on this site. No sensitive plant species were previously reported from the Ysidora Flats site as described in FEIS/R. Therefore, no direct impacts to any sensitive plant species would occur from Alternative 3.

Sensitive Animal Species

The ponds at Lemon Grove are currently under construction. There would not be any additional direct impacts to sensitive animal species (e.g., the coastal California gnatcatcher) from this alternative that have not already been described in the FEIS/R.

No sensitive animal species were observed during the survey of STP 13. Therefore, there would not be any direct impacts to sensitive animal species from construction of the tertiary treatment facility at STP 13.

No direct impacts would occur from construction of the dechlorination facility and outfall. The outfall structure would not impact any riparian habitat, as this structure would be located in a disturbed area. Although no arroyo southwestern toads occur within the project area, it is likely that the BRAC/Levee projects' mitigation site will create habitat for this federally endangered species. The discharge of surplus treated effluent into the mitigation site could create potential breeding ponds for the arroyo southwestern toads downstream from the discharge points.

4.1.4 Alternative 4: Advanced Wastewater Treatment and Discharge in Cased Wells at Lemon Grove

Alternative 4 includes: the construction of an AWT facility adjacent to STP 13; the construction of an equalization basin south of STP 13; use of the ponds at Lemon Grove as described in Alternative 1; and the construction of 11 cased, gravity injection wells to allow the effluent to flow to the groundwater. These wells would be located on the perimeter of the ponds, or in areas between the ponds.

Vegetation Communities

Potential impacts to vegetation communities would be similar to the impacts discussed for Alternative 1.

Construction of the AWT Plant and equalization basin at STP 13 would impact 0.6 acres of non-native grassland and 0.4 acre of developed area. These impacts would not be significant.

Sensitive Plant Species

No sensitive plant species were previously identified within the Lemon Grove ponds in the FEIS/R. No sensitive plant species were identified during the survey of STP 13, and none would be expected to occur on this site. Therefore, no direct impacts to any sensitive plant species would occur from Alternative 4.

Sensitive Animal Species

The ponds at Lemon Grove are currently under construction. There would not be any additional direct impacts to sensitive animal species (e.g. the coastal California gnatcatcher) from this alternative that have not already been described in the FEIS/R. This impact would not be significant.

No sensitive animal species were observed during the survey of STP 13. Therefore, there would not be any direct impacts to sensitive animal species from construction of the AWT facility and equalization basin at STP 13.

4.1.5 Alternative 5: Advanced Wastewater Treatment with Irrigation of Agricultural Fields and Discharge in Cased Wells

Alternative 5 includes: the construction of an AWT facility adjacent to STP 13; the construction of an equalization basin south of STP 13 both as described in Alternative 4; use of the ponds at Lemon Grove as described in Alternative 1; the construction of 11 cased, gravity injection wells as described in Alternative 4; and the construction of a pump station and approximately 7,000 feet of piping to convey the effluent to an existing irrigation reservoir. The pipeline will be placed within existing roadways and/or hung from an existing bridge which crosses the Santa Margarita River, to avoid impacts to sensitive biological resources. The treated effluent would be used for crop irrigation.

Vegetation Communities

Potential impacts to vegetation communities would be similar to the impacts discussed for Alternative 1.

Construction of the AWT Plant and equalization basin at STP 13 would impact 0.6 acres of non-native grassland and 0.4 acre of developed area. These impacts would not be significant.

Sensitive Plant Species

No sensitive plant species were previously identified within the Lemon Grove ponds in the FEIS/R. No sensitive plant species were identified during the survey of STP 13 and none would be expected to occur on this site. Therefore, no direct impacts to any sensitive plant species would occur from Alternative 5.

Sensitive Animal Species

The ponds at Lemon Grove are currently under construction. There would not be any additional direct impacts to sensitive animal species (e.g., the coastal California gnatcatcher) from this alternative that have not already been described in the FEIS/R. This impact would not be significant.

No sensitive animal species were observed during the survey of STP 13. Therefore, there would not be any direct impacts to sensitive animal species from construction of the AWT facility and equalization basin at STP 13.

4.1.6 <u>No Action Alternative</u>

With the No Action Alternative, there would not be any construction of vertical drains, AWT plants, cased wells, or live stream discharge systems as described in the proposed action alternatives. Effluent would be conveyed to the ponds at Lemon Grove in the system now being constructed. Disposal would be by evaporation. When the Lemon Grove ponds fill and the rate of effluent generation exceeds the evaporation rate, effluent could be stored at or near the individual plants in the ponds now used for storage and percolation and planned for abandonment. When all storage ponds are full, excess effluent would be discharged to the Santa Margarita River adjacent to the Lemon Grove ponds. The No Action Alternative would result in continued violation of the Basin Plan.

Vegetation Communities

No direct impacts to vegetation communities would occur from this alternative.

Sensitive Plant Species

Southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*) is known from the Santa Margarita River Estuary. No significant impacts would occur from the No Action Alternative as this species occurs across broad environmental gradients. No other sensitive plant species are known to occur within the area of influence for the No Action Alternative.

Sensitive Animal Species

No impacts to sensitive animal species would occur from the No Action Alternative.

4.2 INDIRECT IMPACTS

Indirect impacts could potentially occur from implementation of the proposed action through increased noise and erosion, and a decrease in water quality during construction. These indirect impacts are of potential concern for the federally listed endangered least Bell's vireo, southwestern willow flycatcher, and arroyo southwestern toad. These potential indirect impacts would be considered significant but mitigable.

4.2.1 Alternative 1: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains

Vegetation Communities

A salt marsh is located at the toe of the bluffs at the northern boundary of the Lemon Grove site. If effluent from the proposed ponds with vertical drains reaches the salt marsh, this community could be impacted by altered salinity. Large influxes of fresh water could decrease the salinity of the salt marsh, potentially altering the species composition. Changes in the composition of the salt marsh could potentially be a significant impact depending upon the extent of changes. In order to avoid this potentially significant impact, cased vertical drains that would discharge the treated effluent to the groundwater would be incorporated into the design of the Lemon Grove pond area.

Sensitive Animal Species

Construction activities would be timed to minimize indirect effects of noise during the breeding season of the least Bell's vireo and the coastal California gnatcatcher. In accordance with the Biological Opinion (USFWS 1995b), noisy activities would be concentrated spatially and temporally during the breeding season to the maximum extent practical. Therefore, there would not be any indirect noise impacts to these species from the proposed project. Therefore, there would not be any indirect noise impacts to these species from the proposed project. Installation of the drains at the Lemon Grove ponds would begin at the north end of the pond site nearest existing potential gnatcatcher habitat and would continue from north to south so that boring activity moves away from the habitat area and the potential for disruption to gnatcatchers arriving early in the breeding season is minimized.

4.2.2 Alternative 2: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains plus Advanced Wastewater Treatment and Reclamation of a Portion of the Effluent (Preferred Alternative)

Vegetation Communities

Indirect impacts from Phase 1 of Alternative 2 would be identical to those for Alternative 1 described above.

Sensitive Animal Species

Construction activities would be timed to minimize indirect effects of noise during the breeding season of the least Bell's vireo, southwestern willow flycatcher and the coastal California gnatcatcher. In accordance with the Biological Opinion (USFWS 1995b), noisy activities would be concentrated spatially and temporally during the breeding season to the maximum extent practical. Therefore, there would not be any indirect noise impacts to these species from the proposed project. Installation of the drains at the Lemon Grove ponds would begin at the north end of the pond site nearest existing potential gnatcatcher habitat and would continue from north to south so that boring activity moves away from the habitat area and the potential for disruption to gnatcatchers arriving early in the breeding season is minimized.

4.2.3 Alternative 3: Tertiary Treated Effluent Blended with Secondary Effluent for Groundwater Recharge at Ysidora Flats

Vegetation Communities

Since the ponds at Lemon Grove are a component of Alternative 3, indirect impacts are the same as described for Alternative 1 in Section 4.2.1. Indirect impacts could also arise from the discharge of effluent at the BRAC/Levee mitigation area at Ysidora Flats. Indirect impacts from the increased effluent discharge and increased nutrient loading could adversely affect the habitat being created. Discharge of too much effluent could convert the mitigation area from willow woodland to freshwater marsh. Similarly, increasing the nutrients on the site could shift the competitive balance from native species to non-native species. Conversion of habitat type and/or increasing the presence of non-native species as a result of effluent discharge would be a significant impact.

Sensitive Animal Species

Construction activities would be timed to minimize indirect effects of noise during the breeding season of the least Bell's vireo, southwestern willow flycatcher and the coastal California gnatcatcher. In accordance with the Biological Opinion (USFWS 1995b), noisy activities would be concentrated spatially and temporally during the breeding season to the maximum extent practical. Therefore, there would not be any indirect noise impacts to these species from the proposed project.

4.2.4 Alternative 4: Advanced Wastewater Treatment and Discharge in Cased Wells at Lemon Grove

Sensitive Animal Species

Construction activities would be timed to minimize indirect effects of noise during the breeding season of the least Bell's vireo and the coastal California gnatcatcher. In accordance with the Biological Opinion (USFWS 1995b), noisy activities would be concentrated spatially and temporally during the breeding season to the maximum extent practical. Therefore, there would not be any indirect noise impacts to these species from the proposed project.

4.2.5 Alternative 5: Advanced Wastewater Treatment with Irrigation of Agricultural Fields and Discharge in Cased Wells

Sensitive Animal Species

Construction activities would be timed to minimize indirect effects of noise during the breeding season of the least Bell's vireo and the coastal California gnatcatcher. In accordance with the Biological Opinion (USFWS 1995b), noisy activities would be concentrated spatially and temporally during the breeding season to the maximum extent practical. Therefore, there would not be any indirect noise impacts to these species from the proposed project.

4.2.6 No Action Alternative

Vegetation Communities

Indirect impacts would result from the lowering of the groundwater table at STP 3 which is addressed in the previous FEIS/R and the Programmatic Groundwater/Riparian Habitat Assessment (MCB Camp Pendleton ESO 1995). Indirect impacts to the riparian and wetland (including salt marsh) communities of the lower Santa Margarita River and Estuary could potentially arise from increases in the hydrological regime, decreases in salinity and increases in nitrogen and phosphorus loading. Impacts to salt marsh habitat would be considered significant by the resources agencies.

Sensitive Plant Species

Southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*) is known from the Santa Margarita River Estuary. Indirect impacts, as described above, are not considered significant as this species occurs across broad environmental gradients. No other sensitive plant species are known to occur within the area of influence for the No Action Alternative.

Sensitive Animal Species

Although changes in the saltmarsh ecosystem would be expected from nutrient loading and a decrease in salinity, no impacts to sensitive wildlife species would occur from the No Action Alternative. The federal endangered tidewater goby (*Eucycogobius newberryi*) is believed extirpated from the site since floods in 1993 (San Marino Environmental Associates 1994).

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5.0 MITIGATION MEASURES

5.1 GENERAL MITIGATION REQUIREMENTS

5.1.1 Best Management Practices

The following general mitigation measures would apply to all construction activities. These measures are standard Best Management Practices (BMPs) to prevent environmental degradation during construction.

1. Provision would be made to inform the construction contractor(s) about the biological constraints of this project. All sensitive habitat areas to be avoided should be clearly marked on project maps provided to the contractor. These areas would be designated as "no construction" zones. These areas would be flagged by the project biologist prior to the onset of construction activities. In some cases, resources may need to be fenced or otherwise protected from direct or indirect impacts.

2. A contractor education program would be implemented to ensure that contractors and all construction personnel are fully informed of the biological resources associated with this project. This program would focus on (a) the purpose for resource protection; (b) contractor identification of sensitive resource areas in the field (e.g., areas delineated on maps and by flags or fencing); (c) sensitive construction practices (see numbers 3 through 10, below); (d) protocol to resolve conflicts that may arise at any time during the construction process; and (e) ramifications of noncompliance. This program would be conducted by a qualified biologist, and would be a requirement for all construction personnel.

3. Activities within drainages or other wetland areas (other than in the construction zone) include staging areas, equipment access, and disposal or temporary placement of excess fill would be prohibited.

4. Vehicles would use existing access roads to the degree feasible. Where new access is required, all vehicles would use the same route. All access routes outside of existing roads or the construction corridor would be clearly marked (i.e., flagged and/or staked) prior to the onset of construction. All access roads outside of existing roads or the construction corridor would be delineated on the grading plans and reviewed by a qualified biologist.

5. Topsoil would be stockpiled in disturbed areas presently lacking native vegetation. Stockpile areas would be delineated on the grading plans and reviewed by a qualified biologist.

6. Fueling of equipment would take place within existing paved roads and not within or adjacent to drainages or native habitats. Contractor equipment would be checked for leaks prior to operation and repaired as necessary. "No-fueling zones" would be designated on construction maps and would be situated a minimum distance of 50 feet from all drainages.

7. Construction in or adjacent to sensitive areas would be appropriately scheduled to minimize potential impacts to biological resources.

8. Erosion and siltation of offsite areas during construction would be minimized. An erosion control plan would be required of the contractor. The project engineer would be responsible for ensuring that the erosion control plan is developed and implemented. The Plan would include the use of hay bales, silt fences, siltation basins, or other devices necessary to stabilize the soil in denuded or graded areas during the construction and revegetation phases of the project.

9. A site restoration plan would be prepared and implemented for all areas where vegetation would be temporarily removed for construction. The plan would detail appropriate plant mixes and methods for reestablishing native vegetation consistent with pre-existing vegetation communities. Plan preparation would be coordinated with the USFWS and the Camp Pendleton Assistant Chief of Staff, Environmental Security (AC/S ES), Land Management Branch.

5.2 RESOURCE-SPECIFIC MITIGATION MEASURES

5.2.1 Coastal California Gnatcatcher

As provided in the FEIS/R, prior to commencement of any construction at the Lemon Grove ponds during the breeding season (February 15 through August 31), a pre-construction survey would be conducted to determine whether any active coastal California gnatcatcher nests are within 500 feet of the construction site; and, all work within 500 feet of a nest would be completed within a continuous 8-week period. Installation of the drains at the Lemon Grove ponds would begin at the north end of the pond site nearest existing potential gnatcatcher habitat and would continue from north to south so that boring activity moves away from the habitat area and the potential for disruption to gnatcatchers arriving early in the breeding season is minimized.

5.2.2 Least Bell's Vireo and Southwestern Willow Flycatcher

As provided in the FEIS/R, prior to commencement of any construction at the Lemon Grove ponds, STP 13, Ysidora Flats, or near Pilgrim Creek during the breeding season (March 15 through September 30), a pre-construction survey would be conducted to determine whether any active least Bell's vireo (at Lemon Grove, STP 13, Ysidora Flats, and Pilgrim Creek) or southwestern willow flycatcher (Ysidora Flats and Pilgrim Creek only) nests are within 500 feet of the construction site; and, all work within 500 feet of a nest would be completed within a continuous 8-week period.

5.3 ALTERNATIVE-SPECIFIC MITIGATION MEASURES

5.3.1 Alternative 1: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains

There would be no additional mitigation measures for this alternative other than the BMPs outlined in Section 5.1 (BMPs) and the resource-specific mitigation measures outlined in Section 5.2.

5.3.2 Alternative 2: Discharge of Secondary Effluent at Lemon Grove in Ponds with Cased Vertical Drains plus Advanced Wastewater Treatment and Reclamation of a Portion of the Effluent (Preferred Alternative)

There would be no additional mitigation measures for this alternative other than the BMPs outlined in Section 5.1 (BMPs) and the resource-specific mitigation measures outlined in Section 5.2.

5.3.3 Alternative 3: Tertiary Treatment Blended with Secondary Effluent for Groundwater Recharge at Ysidora Flats

In addition to the BMPs discussed in Section 5.1 and the resource-specific mitigation measures outlined in Section 5.2, the following additional measures would be implemented for Alternative 3:

1. The discharge of tertiary treated effluent to the Santa Margarita River at Ysidora Flats shall be designed and implemented as allowed in an appropriate NPDES in accordance with the mitigation measure for Hydrology and Water Quality Impacts in Section 4.1.2 of the FSEIS.

2. In accordance with the Biological Opinion (BO 1-6-95-F-02) for Programmatic Activities in Riparian and Estuarine/Beach Ecosystems on Camp Pendleton (USFWS 1995a), the

mitigation site at Ysidora Flats would be designed and monitored in conjunction with long-term monitoring programs for the BRAC/Levee projects:

A. The proposed outfall or discharge system would be designed such that water would be evenly distributed over the mitigation site to avoid creation of ponded areas and freshwater marsh at the discharge point(s).

B. Hydrology (groundwater and surface water) would be monitored to determine hydrological adequacy for the establishment of a riparian wetlands ecosystem. Hydrological adequacy would be evaluated according to the performance criteria of the draft Santa Margarita Hydrogeomorphic (HGM) guidebook established for the mitigation site. Monitoring results would be included in annual monitoring reports for the BRAC/Levee mitigation projects.

C. Nutrient content in soil and water would be monitored to determine chemical adequacy for the establishment of a riparian wetlands ecosystem. Adequacy of nutrient content would be evaluated according to the performance criteria of the draft Santa Margarita HGM guidebook established for the mitigation site. Monitoring results would be included in annual reports for the BRAC/Levee mitigation projects.

D. Species recruitment would be monitored for five years following the outfall installation and evaluated against the riparian ecosystem establishment criteria (according to the draft Santa Margarita HGM guidebook). Monitoring results would be included in annual reports for the BRAC/Levee mitigation projects.

E. Exotic invasive weeds would be monitored and controlled, with the target not to exceed five percent relative cover of the site after five years and twelve consecutive months of monitoring. Monitoring results would be included in annual monitoring reports for the BRAC/Levee mitigation projects.

F. Potential colonization of arroyo southwestern toads in the area would be monitored. Monitoring results would be included in annual reports for the BRAC/Levee mitigation projects.

G. Remediation measures would include lowering the effluent volume at the discharge points to prevent the establishment of freshwater marsh habitats in place of willow woodland.

5.3.4 Alternative 4: Advanced Wastewater Treatment and Discharge in Cased Wells at Lemon Grove

Mitigation measures for this alternative would include the BMPs discussed in Section 5.1 and the resource-specific mitigation measures outlined in Section 5.2.

5.3.5 Alternative 5: Advanced Wastewater Treatment with Irrigation of Agricultural Fields and Discharge in Cased Wells

Mitigation measures for this alternative would include the BMPs discussed in Section 5.1 and the resource-specific mitigation measures outlined in Section 5.2.

5.3.6 No Action Alternative

Potential indirect impacts to salt marsh habitat within the Santa Margarita Estuary from a decrease in salinity and potential nutrient loading would be mitigated by a long-term monitoring program to include hydrological and soil testing for changes in nutrient and salinity levels, and vegetation and wildlife sampling to note changes in such parameters as species composition and distribution. Potential surface water and estuary habitat impacts could be mitigated by implementation of Alternatives 1, 2, 3, 4, or 5, or a combination thereof which would achieve the purpose and need of the proposed project.

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6.0 CUMULATIVE EFFECTS

Cumulative effects are the additive direct and indirect impacts to biological resources resulting in implementation of all foreseeable projects within the region, as defined by the Base boundary of Camp Pendleton. Development of the study area would directly impact sensitive biological resources including Diegan coastal sage scrub/coastal California gnatcatcher habitat, vernal pools/ San Diego fairy shrimp habitat, arroyo southwestern toad, and potentially Pacific pocket mouse. In addition, construction of the project may result in impacts in the form of increased siltation or sedimentation into the Santa Margarita River, which is known to support a breeding population of arroyo southwestern toad, as well as potentially increasing ambient noise levels within nesting habitat of the least Bell's vireo and the southwestern willow flycatcher. These impacts to federally listed species are considered significant. However, since all federal actions affecting federally listed species within the region are subject to consultation by the USFWS and would be mitigated, any approved federal action is not considered to be cumulatively significant regarding these species.

Installation of a valve in the existing pipeline adjacent to Vandegrift Boulevard at the BRAC/Levee projects' wetland mitigation site at Ysidora Flats would facilitate future discharge of treated effluent into the Santa Margarita River. This future project would be designed to recharge the groundwater should lowered groundwater levels from removal of the existing discharges impact the BRAC/Levee wetland mitigation site.

Direct impacts from future installation of an outfall structure at Ysidora Flats would not be significant because no sensitive plant or animal species occur in this area. Indirect impacts could arise from the increased effluent discharge and from increased nutrient loading which could adversely affect the habitat being created. Discharge of too much effluent could convert the mitigation area from willow woodland to freshwater marsh. Similarly, increasing the nutrients on the site could shift the competitive balance from native species to non-native species. Conversion of habitat type and/or increasing the presence of non-native species as a result of effluent discharge would be a significant impact.

In accordance with the Biological Opinion (USFWS 1995b), the mitigation site at Ysidora Flats would be designed and monitored in conjunction with long-term monitoring programs for the BRAC/Levee projects. These impacts would be less than significant since the discharge activity would be designed to recharge the groundwater in a manner that would benefit the restored wetland habitat. This discharge would be planned and monitored in accordance with a program that would be approved and permitted by the cognizant resource agencies. Negative impacts to the wetland

habitat would result in the cessation of discharge at Ysidora Flats and the diversion of STP 1 and 2 effluent discharge to the Lemon Grove ponds.

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ATTACHMENT A
FLORAL SPECIES LIST

Class/SubClass	Family	Scientific Name/Common Name
ANGIOSPERMAE		
Dicotyledoneae		
	Aizoaceae - Carpet-Weed Family	
		Carpobrotus edulis Hottentot Fig
		Tetragonia tetragonioides New Zealand Spinach
	Anacardiaceae - Sumac Family	
		Malosma laurina Laurel Sumac
		Rhus integrifolia Lemonadeberry
		Schinus molle Peruvian Pepper Tree
		Schinus terebinthifolius Brazilian Pepper Tree
	Apiaceae - Carrot Family	
		Foeniculum vulgare Fennel
	Asteraceae - Sunflower Family	
		Ambrosia psilostachya Western Ragweed
		Baccharis pilularis var. *consanguinea* Coyote Brush
		Baccharis salicifolia Mule Fat
		Gnaphalium bicolor Bicolor cudweed
		Heterotheca grandiflora Telegraph Weed
		Isocoma menziesii var. *vernonioides* Coastal Isocoma
		Jaumea carnosa Salty Susan
		Lactuca sativa
		Lessingia filaginifolia var. *virgata* Virgate Cudweed-Sand-Aster
		Senecio vulgaris Common Groundsel
		Xanthium strumarium var. *canadense* Eastern Cocklebur
	Boraginaceae - Borage Family	
		Heliotropium curassavicum Chinese Pusley
	Brassicaceae - Mustard Family	
		Cakile maritima Sea Rocket
		Hirschfeldia incana Perennial Mustard
		Raphanus sativus Radish
	Cactaceae - Cactus Family	
		Opuntia littoralis Coastal Prickly-pear
		Opuntia parryi var. *parryi* Cane Cholla
	Capparaceae - Caper Family	
		Isomeris arborea Bladderpod
	Caprifoliaceae - Honeysuckle Family	
		Sambucus mexicana Blue Elderberry

Class/SubClass	Family	Scientific Name/Common Name
	Chenopodiaceae - Goosefoot Family	
		Atriplex semibaccata Australian Saltbush
		Salicornia subterminalis Parish's Glasswort
		Salsola tragus Russian-Thistle, Tumbleweed
		Suaeda taxifolia Woolly Sea-Blight
	Crassulaceae -Stone-Crop Family	
		Dudleya pulverulenta ssp. *pulverulenta* Chalk Lettuce
	Curcurbitaceae - Gourd Family	
		Marah macrocarpus var. *macrocarpus* Wild Cucumber
	Euphorbiaceae -Spurge Family	
		Croton californicus Croton
		Ricinus communis Castor Bean
	Fabaceae - Pea Family	
		Acacia sp. Wattle
		Lotus scoparius var. *scoparius* Coastal Deerweed
		Trifolium sp. Clover
	Frankeniaceae - Frankenia Family	
		Frankenia salina Alkali Heath
	Lamiaceae - Mint Family	
		Marrubium vulgare Horehound
	Lythraceae - Loosestrife Family	
		Lythrum hyssopifolia Grass Poly
	Malvaceae - Mallow Family	
		Malvella leprosa Alkali Mallow
	Myoporaceae - Myoporum Family	
		Myoporum laetum Myoporum
	Myrtaceae - Myrtle Family	
		Eucalyptus sp. Eucalyptus
	Nyctaginaceae - Four O'Clock Family	
		Mirabilis californica Wishbone Bush
	Onagraceae - Evening Primrose Family	
		Camissonia cheiranthifolia ssp. *suffruticosa* Beach Evening Primrose
	Plantaginaceae - Plantain Family	
		Plantago elongata Plaintain
		Plantago ovata Wooly Plantain
	Plumbaginaceae - Leadwort Family	
		Limonium perezii Statice
	Polygonaceae - Buckwheat Family	
		Rumex crispus Curly Dock
	Rosaceae - Rose Family	
		Heteromeles arbutifolia Toyon

Class/SubClass	Family	Scientific Name/Common Name
	Salicaceae - Willow Family	
		Salix exigua Narrow-Leaved Willow
		Salix gooddingii Goodding's Black Willow
		Salix lasiolepis Arroyo Willow
	Solanaceae - Nightshade Family	
		Datura wrightii Jimson Weed
		Lycium californicum California Box-Thorn
		Nicotiana glauca Tree Tobacco
	Tamaricaceae -Tamarisk Family	
		Tamarix sp. Tamarisk
	Urticaceae - Nettle Family	
		Urtica dioica ssp.*holosericea* Stinging Nettle
		Urtica urens Dwarf Nettle
Monocotyledoneae		
	Cyperaceae -Sedge Family	
		Cyperus sp. Umbrella Sedge
		Eleocharis macrostachya Pale Spikerush
	Juncaceae - Rush Family	
		Juncus sp. Rush
	Poaceae - Grass Family	
		Arundo donax Giant Reed
		Avena barbata Slender Wild Oat
		Cynodon dactylon Bermuda Grass
		Distichlis spicata Saltgrass
		Nasella pulchra Purple Needlegrass
		Orcuttia californica California Orcutt Grass
		Pennisetum setaceum Fountain Grass

ATTACHMENT B
WILDLIFE SPECIES LIST

Scientific Name	Common Name
INVERTEBRATES	
Phylum: Arthropoda	
Class: Insecta	
Order: Lepidoptera	**Butterflies**
Danaus plexippus	monarch butterfly
VERTEBRATES	
REPTILES AND AMPHIBIANS	
Order Salientia	**Frogs and Toads**
Family Hylidae	
Hyla cadaverina	California treefrog
Order Squamata	**Lizards and Snakes**
Family Iguanidae	
Sceloporus occidentalis	western fence lizard
Family Colubridae	
Pituophis melanoleucus	gopher snake
BIRDS	
Order Ciconiiformes	**Herons, Storks, Ibises, and Relatives**
Family Ardeidae	
Ardea herodias	great blue heron
Order Anseriformes	**Screamers, Ducks, and Relatives**
Family Anatidae	
Lophodytes cucullatus	hooded merganser
Anas platyrhynchos	mallard
Order Falconiformes	**Vultures, Hawks, and Falcons**
Family Cathartidae	
Cathartes aura	turkey vulture
Family Accipitridae	
Pandion haliaetus	osprey
Elanus leucurus majusculus	white-tailed kite
Accipiter cooperi	Cooper's hawk
Buteo jamaicensis	red-tailed hawk
Buteo lineatus	red-shouldered hawk

Scientific Name		Common Name
Order Charadriiformes		**Shorebirds, Gulls, and Relatives**
Family Charadriidae		
	Charadrius vociferus	killdeer
Family Recurvirostridae		
	Himantopus mexicanus	black-necked stilt
Family Laridae		
	Larus sp.	gull
Order Columbiformes		**Pigeons and Doves**
Family Columbidae		
	Zenaida macroura	mourning dove
Order Apodiformes		**Swifts and Hummingbirds**
Family Trochilidae		
	Calypte anna	Anna's hummingbird
	Calypte costae	Costa's hummingbird
Order Passeriformes		**Perching Birds**
Family Tyrannidae		
	Sayornis nigricans	black phoebe
	Tyrannus vociferans	Cassin's kingbird
Family Corvidae		
	Aphelocoma coerulescens	scrub jay
	Corvus brachyrhynchos	American crow
	Corvus corax	common raven
Family Aegithalidae		
	Psaltriparus minimus	bushtit
Family Troglodytidae		
	Thryomanes bewickii	Bewick's wren
	Cistothorus palustris	marsh wren
Family Muscicapidae		
	Polioptila californica californica	coastal California gnatcatcher
Family Mimidae		
	Mimus polyglottos	northern mockingbird
	Toxostoma redivivum	California thrasher
Family Laniidae		
	Lanius ludovicianus	loggerhead shrike

Scientific Name	Common Name
Family Sturnidae	
Sturnus vulgaris	European starling
Family Emberizidae	
Geothlypis trichas	common yellowthroat
Dendroica petechia	yellow warbler
Dendroica coronata	yellow-rumped warbler
Pipilo crissalis	California towhee
Zonotrichia leucophrys	white-crowned sparrow
Melospiza melodia	song sparrow
Carpodacus mexicanus	house finch
Carduelis psaltria	lesser goldfinch
Agelaius phoeniceus	red-winged blackbird
MAMMALS	
Order Rodentia	**Squirrels, Rats, Mice, and Relatives**
Family Sciuridae	
Spermophilus beecheyi	California ground squirrel
Order Lagomorpha	**Rabbits, Hares, and Pikas**
Sylvilagus audubonii	Audubon's cottontail
Order Carnivora	**Carnivores**
Family Canidae	
Canis latrans	coyote
Canis familiaris	domestic dog

APPENDIX C
RECORD OF NON-APPLICABILITY (RONA) AND AIR QUALITY CALCULATIONS

UNITED STATES MARINE CORPS
MARINE CORPS BASE
BOX 555010
CAMP PENDLETON CALIFORNIA 92055-5010

IN REPLY REFER TO
5090.6
ENVSEC/425
11 AUG 1998

From: Commanding General, Marine Corps Base, Camp Pendleton
To: Commandant of the Marine Corps (LFL), Headquarters, U.S. Marine Corps, 2 Navy Annex, Washington, D.C. 20380-1775

Subj: RECORD OF NON-APPLICABILITY FOR MILCON PROJECT P-257B

Ref: (a) Draft Supplemental Environmental Impact Statement, Sewage Effluent Compliance Project, Lower Santa Margarita Basin, Marine Corps Base, Camp Pendleton, dated July 1998

1. Pursuant to section 176(c) of the Clean Air Act, 42 U.S.C § 7401, *et seq*, (1990); the General Conformity Rule at 40 C.F.R. Parts 51 and 93; and the Department of the Navy (DoN) policy regarding compliance with the requirements of the Clean Air Act General Conformity Rule, the DoN has determined that this project is exempt from a conformity determination based upon 40 C.F.R. §§ 51.853(d)(4) and 93.153(d)(4). These provisions state that a conformity determination is not required for actions "... as specifically required by new or existing environmental legislation or environmental regulations ..." Further, guidance from the U.S. Environmental Protection Agency (EPA) on this exemption provides that a wastewater treatment plant under the Clean Water Act is exempt, unless the upgrade involves an increase in capacity. The proposed action to dispose of effluent from Marine Corps Base, Camp Pendleton sewage treatment plants 1, 2, 3, 8, and 13, by any of the five alternative methods described in the reference, is exempt because the action is required to conform to the Clean Water Act and regulations of the EPA and the California State Water Resources Control Board, and does not involve an increase in capacity. Nevertheless, the DON conducted a conformity applicability analysis of the air emissions associated with this project.

2. The conformity applicability analysis for this project establishes that the projected air emissions of the criteria pollutants of concern associated with the action will be below the applicable de minimis thresholds and will not be regionally significant. Therefore, the subject project is presumed to be exempt from full conformity determinations under the General Conformity Rule, 40 C.F.R. sections 93.153(c)(1) and (i). Sections 3.8, 4.8, 5.2.2, and Appendix (C) of reference (a) provide summaries of the assumptions, methodologies, and calculations that support this determination. This conformity review concludes that the total project emissions of criteria pollutants resulting from the proposed project will not exceed the de minimus thresholds specified in the EPA regulations.

C. W. REINKE

Activity/Equipment	No. gas	No. diesel	Hrs/ Day	Days/ Year	Emissions - pounds/day									
Alt 1					CO		ROC		NOx		SOx		PM_{10}	
Drains & trench					G	D	G	D	G	D	G	D	G	D
Fork Lift - 50 HP					0	0	0	0	0	0	0	0	0	0
Fork Lift - 175 HP					0	0	0	0	0	0	0	0	0	0
Truck - off highway					0	0	0	0	0	0	0	0	0	0
Tracked loader					0	0	0	0	0	0	0	0	0	0
Tracked tractor=backhoe		1	6	15	0	2.1	0	0.72	0	7.56	0	0.84	0	0.672
Scraper					0	0	0	0	0	0	0	0	0	0
Wheeled dozer					0	0	0	0	0	0	0	0	0	0
Wheeled loader					0	0	0	0	0	0	0	0	0	0
Wheeled tractor					0	0	0	0	0	0	0	0	0	0
Roller					0	0	0	0	0	0	0	0	0	0
Motor Grader					0	0	0	0	0	0	0	0	0	0
Miscellaneous-Hydropuller, Hydrostat		1	6	22	0	4.05	0	0.9	0	10.2	0	0.858	0	0.84
Light trucks - G or D	1		4	45	3		0.352		0.628				0.044	
Crew commute	trip/day	mi/trip	--											
	10	20	--	45	2.9826		0.2259		0.198				0.046	
Fugitive Dust - PM10 Unmitigated			Hrs/ Day	Days/ Year	silt	moisture	wind	truck wt(T)	truck speed				PM_{10}	$PM_{2.5}$
Grading/earth moving					30	12	--	--	--				0	0
Material handling	yd^3/day		--		--	6	7.7	--	--				0	0
Exposed graded areas	Acre		--						--				0	0
Storage piles	Acre		--						--					
Trucks/paved roads	mi/trip; trip/day	10	5	22	15	--	--	15	--				33.14	14.5
Trucks/unpaved roads		0.33	5	30	20	0.25	--	10	15				9.747	1.462
Totals					CO		ROC		NOx		SOx		PM_{10}	$PM_{2.5}$
	pounds/year				390		57		375		31		1054	363
	Tons/year				0.19		0.03		0.19		0.016		0.53	0.18

Activity/Equipment	No. gas	No. diesel	Hrs/ Day	Days/ Year	Emissions - pounds/day									
Alt 2 ph 2					CO		ROC		NOx		SOx		PM_{10}	
AWT STP2 + YF					G	D	G	D	G	D	G	D	G	D
Fork Lift - 50 HP					0	0	0	0	0	0	0	0	0	0
Fork Lift - 175 HP					0	0	0	0	0	0	0	0	0	0
Truck - off highway		1	4	5	0	7.2	0	0.76	0	16.68	0	1.8	0	1.04
Tracked loader					0	0	0	0	0	0	0	0	0	0
Tracked tractor=backhoe		1	6	10	0	2.1	0	0.72	0	7.56	0	0.84	0	0.672
Scraper					0	0	0	0	0	0	0	0	0	0
Wheeled dozer					0	0	0	0	0	0	0	0	0	0
Wheeled loader					0	0	0	0	0	0	0	0	0	0
Wheeled tractor=Crane					0	0	0	0	0	0	0	0	0	0
Roller					0	0	0	0	0	0	0	0	0	0
Motor Grader					0	0	0	0	0	0	0	0	0	0
Miscellaneous					0	0	0	0	0	0	0	0	0	0
SCAQMD industrial	Ksqft=	20												
Light trucks - G or D	1		4	20	3		0.352		0.628				0.044	
Crew commute	trip/day	mi/trip	--											
	10	20	--	20	2.9826		0.2259		0.198				0.046	
Fugitive Dust - PM10 Unmitigated			Hrs/ Day	Days/ Year	silt	moisture	wind	truck wt(T)	truck speed				PM_{10}	$PM_{2.5}$
Grading/earth moving			4	5	30	12	--	--	--				20.14	6.154
Material handling	yd^3/day		--		--	6	7.7	--	--				0	0
Exposed graded areas	Acre		--						--				0	0
Storage piles	Acre		--						--					
Trucks/paved roads	mi/trip; trip/day				1	--	--	15	--				0	0
Trucks/unpaved roads					20	0.25	--	10	15				0	0
Totals					CO		ROC		NOx		SOx		PM_{10}	$PM_{2.5}$
	pounds/year				2272		678		9813		17		799	31
	Tons/year				1.14		0.34		4.91		0.009		0.4	0.02

Activity/Equipment	No. gas	No. diesel	Hrs/ Day	Days/ Year	Emissions - pounds/day									
Alt 3					CO		ROC		NOx		SOx		PM_{10}	
AWT STP13 + YF + pipe					G	D	G	D	G	D	G	D	G	D
Fork Lift - 50 HP					0	0	0	0	0	0	0	0	0	0
Fork Lift - 175 HP					0	0	0	0	0	0	0	0	0	0
Truck - off highway		1	4	5	0	7.2	0	0.76	0	16.68	0	1.8	0	1.04
Tracked loader					0	0	0	0	0	0	0	0	0	0
Tracked tractor=backhoe		1	6	35	0	2.1	0	0.72	0	7.56	0	0.84	0	0.672
Scraper					0	0	0	0	0	0	0	0	0	0
Wheeled dozer					0	0	0	0	0	0	0	0	0	0
Wheeled loader					0	0	0	0	0	0	0	0	0	0
Wheeled tractor=Crane					0	0	0	0	0	0	0	0	0	0
Roller					0	0	0	0	0	0	0	0	0	0
Motor Grader					0	0	0	0	0	0	0	0	0	0
Miscellaneous					0	0	0	0	0	0	0	0	0	0
SCAQMD industrial	Ksqft=	40												
Light trucks - G or D	1		4	70	3		0.352		0.628				0.044	
Crew commute	trip/day	mi/trip	--											
	20	20	--	70	5.9652		0.4518		0.396				0.093	
Fugitive Dust - PM10 Unmitigated			Hrs/ Day	Days/ Year	silt	moisture	wind	truck wt(T)	truck speed				PM_{10}	$PM_{2.5}$
Grading/earth moving			4	25	30	12	--	--	--				20.14	6.154
Material handling	yd^3/day		--		--	6	7.7	--	--				0	0
Exposed graded areas	Acre		--						--				0	0
Storage piles	Acre		--						--					
Trucks/paved roads	mi/trip; trip/day	25	4	35	1	--	--	15	--				11.4	4.988
Trucks/unpaved roads					20	0.25	--	10	15				0	0
Totals					CO		ROC		NOx		SOx		PM_{10}	$PM_{2.5}$
	pounds/year				4929		1397		19695		38		2310	328
	Tons/year				2.46		0.70		9.85		0.019		1.15	0.16

Activity/Equipment	No. gas	No. diesel	Hrs/ Day	Days/ Year	Emissions - pounds/day									
Alt 4					**CO**		**ROC**		**NOx**		**SOx**		**PM_{10}**	
AWT STP13/EB + cased wells					G	D	G	D	G	D	G	D	G	D
Fork Lift - 50 HP					0	0	0	0	0	0	0	0	0	0
Fork Lift - 175 HP					0	0	0	0	0	0	0	0	0	0
Truck - off highway		1	4	5	0	7.2	0	0.76	0	16.68	0	1.8	0	1.04
Tracked loader					0	0	0	0	0	0	0	0	0	0
Tracked tractor=backhoe					0	0	0	0	0	0	0	0	0	0
Scraper					0	0	0	0	0	0	0	0	0	0
Wheeled dozer					0	0	0	0	0	0	0	0	0	0
Wheeled loader					0	0	0	0	0	0	0	0	0	0
Wheeled tractor=Crane		1	4	15	0	14.32	0	0.72	0	5.08	0	0.36	0	0.56
Roller					0	0	0	0	0	0	0	0	0	0
Motor Grader					0	0	0	0	0	0	0	0	0	0
Miscellaneous		1	6	30	0	4.05	0	0.9	0	10.2	0	0.858	0	0.84
SCAQMD industrial	Ksqft=	40												
Light trucks - G or D	1		4	60	3		0.352		0.628				0.044	
Crew commute	trip/day	mi/trip	--											
	10	20	--	60	2.9826		0.2259		0.198				0.046	
Fugitive Dust - PM10 Unmitigated			Hrs/ Day	Days/ Year	silt	moisture	wind	truck wt(T)	truck speed				PM_{10}	$PM_{2.5}$
Grading/earth moving			4	30	30	12	--	--	--				20.14	6.154
Material handling	yd^3/day		--		--	6	7.7	--	--				0	0
Exposed graded areas	Acre		--						--				0	0
Storage piles	Acre		--						--					
Trucks/paved roads	mi/trip; trip/day	20	3	10	1	--	--	15	--				6.84	2.993
Trucks/unpaved roads		0.33	6	15	20	0.25	--	10	15				11.7	1.754
Totals					**CO**		**ROC**		**NOx**		**SOx**		**PM_{10}**	**$PM_{2.5}$**
		pounds/year			4923		1388		19790		40		2261	241
		Tons/year			2.46		0.69		9.90		0.02		1.13	0.12

Activity/Equipment	No. gas	No. diesel	Hrs/ Day	Days/ Year	Emissions - pounds/day									
Alt 5					CO		ROC		NOx		SOx		PM_{10}	
piping only (add to alt 4)					G	D	G	D	G	D	G	D	G	D
Fork Lift - 50 HP					0	0	0	0	0	0	0	0	0	0
Fork Lift - 175 HP					0	0	0	0	0	0	0	0	0	0
Truck - off highway		1	4	5	0	7.2	0	0.76	0	16.68	0	1.8	0	1.04
Tracked loader					0	0	0	0	0	0	0	0	0	0
Tracked tractor=backhoe		1	6	20	0	2.1	0	0.72	0	7.56	0	0.84	0	0.672
Scraper					0	0	0	0	0	0	0	0	0	0
Wheeled dozer					0	0	0	0	0	0	0	0	0	0
Wheeled loader					0	0	0	0	0	0	0	0	0	0
Wheeled tractor=Crane					0	0	0	0	0	0	0	0	0	0
Roller					0	0	0	0	0	0	0	0	0	0
Motor Grader					0	0	0	0	0	0	0	0	0	0
Miscellaneous					0	0	0	0	0	0	0	0	0	0
SCAQMD industrial	Ksqft=													
Light trucks - G or D	1		4	40	3		0.352		0.628				0.044	
Crew commute	trip/day	mi/trip	--											
	20	20	--	40	5.9652		0.4518		0.396				0.093	
Fugitive Dust - PM10 Unmitigated			Hrs/ Day	Days/ Year	silt	moisture	wind	truck wt(T)	truck speed				PM_{10}	$PM_{2.5}$
Grading/earth moving					30	12	--	--	--				0	0
Material handling	yd^3/day		--		--	6	7.7	--	--				0	0
Exposed graded areas	Acre		--						--				0	0
Storage piles	Acre		--						--					
Trucks/paved roads	mi/trip; trip/day	25	4	20	1	--	--	15	--				11.4	4.988
Trucks/unpaved roads					20	0.25	--	10	15				0	0
Totals					CO		ROC		NOx		SOx		PM_{10}	$PM_{2.5}$
	pounds/year				437		50		276		26		252.1	100
	Tons/year				0.22		0.03		0.14		0.013		0.13	0.05

APPENDIX D
FEIS/R RECORD OF DECISION

DEPARTMENT OF DEFENSE
Department of the Navy

Record of decision to implement the sewage effluent compliance project for the Santa Margarita River basin of Marine Corps Base, Camp Pendleton, California

Pursuant to Section 102(c) of the National Environmental Policy Act (NEPA) of 1969, and the Council on Environmental Quality Regulations (40 CFR parts 1500-1508), the Department of the Navy announces its decision to upgrade the wastewater treatment and disposal systems in the Santa Margarita River Basin of Marine Corps Base (MCB), Camp Pendleton, California. Upgrades in the Santa Margarita River Basin include the construction of a series of wastewater discharge flow percolation/equalization ponds inland from the coastline, and a connecting pipeline, approximately 98,000 total lineal feet, to connect percolation/equalization ponds serving sewage treatment plants 1, 2, 3, 8 and 13 to the La Salina ocean outfall, which is owned and operated by the City of Oceanside. The project will be constructed in two phases. Phase one includes construction of new infrastructure linking facilities on Camp Pendleton. Phase two includes pipeline construction from the percolation/equalization ponds on Camp Pendleton to the La Salina Oceanside ocean outfall, as well as authorize execution of the utility service agreement contract with the City of Oceanside for the use of the outfall.

16,000 LINEAL FEET OF PIPELINE TO CITY OF OCEANSIDE WILL NOT BE REQUIRED

NOT IMPLEMENTED

Sewage treatment plants 3 and 8 were constructed in the 1940's and currently discharge secondary treated effluent to percolation basins adjacent to the sewage treatment plants within a beneficial use portion of the lower Santa Margarita River Basin. Sewage treatment plant 1 was constructed in the 1940's and currently discharges secondary treated effluent to oxidation ponds and then as a surface discharge to the Santa Margarita River Basin at locations distant from the plant. Sewage treatment plant 2 was constructed prior to 1960 and currently discharges secondary effluent that is primarily diverted for irrigation use at the Marine Memorial Golf Course with any excess effluent discharged to the Santa Margarita River via a series of oxidation ponds, open channel trenches and pipelines. Sewage treatment plant 13 was constructed prior to 1960 and was designed to discharge secondary effluent via force main pipeline to percolation ponds in the lower Santa Margarita River, approximately 3 miles distant (upriver). The force main pipeline

was damaged by the January 1993 flood; consequently sewage treatment plant 13 discharges secondary effluent directly to the Santa Margarita River at a location adjacent to the estuary. Groundwater extracted from this basin serves developments within the southern portion of MCB Camp Pendleton. The current quality of effluent discharged into the Santa Margarita River Basin, from all plants, does not meet the standards of the 1994 San Diego Water Quality Basin Plan, the State of California Porter Cologne Water Quality Act of 1969, and the National Pollution Discharge Elimination System requirements of the Federal Water Pollution Control Act of 1972. As a result of these discharges, the San Diego Regional Water Quality Control Board issued Cease and Desist Orders to MCB Camp Pendleton in January 1989. To comply with these Cease and Desist Orders, new facilities are required to improve wastewater treatment and disposal practices and meet the Basin Plan objectives.

Alternatives considered for correcting the conditions cited in the Cease and Desist Orders included water disposal of effluent, land disposal of effluent and no action. Water disposal alternatives included construction of an ocean outfall, live-stream discharge of either secondary- or tertiary-treated effluent to the Santa Margarita River, discharge to an off-base publicly owned treatment works, and a basin plan amendment. Land disposal alternatives included percolation basins, biological ponds, leach fields, and injection wells.

The preferred alternative, as identified in the Draft Environmental Impact Statement (DEIS) consists of the construction of 98,000 feet of pipeline, and percolation/equalization ponds connecting all five Base sewage treatment plants and traversing through the City of Oceanside, to the City owned La Salina ocean outfall for ultimate disposal. Though all five sewage treatment plants will be connected to the ocean outfall, only sewage treatment plant 13 normally will discharge to this outfall. The other sewage treatment plants will discharge to the outfall during storm events. The Base sewage treatment plants would continue to treat sewage and discharge effluent at the current secondary level. This alternative is identified in the Final Environmental Impact Statement (FEIS) as the environmentally preferred alternative for the Santa Margarita River. Connection to the La Salina ocean outfall will require the approval of the City of Oceanside.

OCEANSIDE OUTFALL NO IMPLEMENT

OCEANSIDE OUTFALL NO IMPLEMENT

A systematic and multidisciplinary approach to identify alternatives was utilized which incorporated criteria based upon technical and functional suitability. Alternatives were evaluated for technical suitability consistent with the numerous constraints imposed by available land for treatment and disposal facilities and subsurface geological and hydrogeological conditions. Technically suitable alternatives were further evaluated for their ability to satisfy the following six functional requirements of the project: (1) prevention of degradation of water quality to sustain beneficial uses identified in the San Diego Basin Plan, (2) compliance with water quality standards in accordance with State Groundwater Recharge Guidelines, (3) compliance with water quality standards in accordance with Federal and State safe drinking water standards, (4) compliance with the timelines identified in the Cease and Desist Orders, (5) maintenance of sustained volume within each water basin, and (6) prevention of saltwater intrusion into each water basin. The analysis determined that the preferred alternative is the only alternative that meets all six functional requirement criteria, and is therefore the most environmentally preferable.

All practical means to avoid or minimize environmental harm have been adopted as identified below and are amplified in the FEIS.

Construction of the on Base percolation/equalization ponds and pipeline within the Santa Margarita River will require grading and excavation. A soil erosion control plan will be prepared for construction, and will include restricting grading and excavation during the rainy season, restricting heavy equipment to existing roads and rights-of-way, installing sediment control measures, and implementing post-construction revegetation. Construction of the facilities within the City of Oceanside will also require trenching operations. Implementation of the pipeline project segments within Oceanside will be performed consistent with grading operation specifications developed by the City of Oceanside.

OCEANSIDE OUTFALL NOT IMPLEMENTED

To reduce potential significant impacts on paleontological resources to an acceptable level, the Marine Corps will develop an environmental education program, develop an information pamphlet and conduct an environmental education class for all construction project personnel. Additionally, environmental monitors shall be present when construction activities occur in designated sensitive areas. Environmental monitors shall ensure

that paleontological resources are recovered according to approved procedures. If paleontological resources are identified aboard the Base or within the City of Oceanside and salvage efforts are required, the Marine Corps will curate the materials. Those materials found in the City of Oceanside will be provided to the City as requested.

OCEANSIDE OUTFALL NOT IMPLEMENTE

The Southwestern willow flycatcher (*Empidonax trailii*), the least Bell's vireo (*Vireo belli pusillus*) and the Arroyo southwest toad (*Bufo mocroscaphus*), all federally listed endangered species, are known to occur in the riparian areas of the Santa Margarita River drainage. The vireo and the flycatcher are known to occur in the Pilgrim Creek reach of the San Luis Rey River drainage.

Construction activities will likely be completed outside of the vireo and flycatcher breeding season (March 15 through September 15). Clearing of the vegetation will be completed prior to the breeding season. This will avoid the possibility of vireos and flycatchers nesting within the area that may be directly affected by the construction activities. In addition, construction outside of the breeding season will avoid indirect noise impacts to the species.

For construction that cannot be accomplished between September 15 to March 15, additional mitigation measures will be implemented in accordance with the United States Fish and Wildlife Service Section 7 Endangered Species Act Biological Opinion for Programmatic Activities and Conservation Plans in Riparian and Estuarine/Beach Ecosystems on Marine Corps Base Camp Pendleton, BO 1-6-95-F-02 (Riparian Biological Opinion) and the United States Army Corps of Engineers Section 404 Permit will be implemented. These will include a pre-construction survey that will determine whether any active vireo or flycatcher nests are within 500 feet of the construction corridor prior to construction activity. All work within 500 feet of a nest will be completed within a continuous 8-week period.

To avoid the small possibility that arroyo southwestern toads, or that other wildlife, could be injured by falling into open trenches or by burrowing into trench walls or spoils piles, no trenches will be left unprotected at night. If the arroyo southwestern toad breeding season (February 1 to September 30) cannot be avoided and preconstruction surveys reveal that construction will take place in toad habitat, mitigation measures will be implemented as mandated by the Riparian Biological

Opinion, including fencing the pipeline corridor with silt-screen or shade cloth material the night prior to trenching and removing all toads within the enclosure. Any necessary removal of toads or other animals from trenches will be performed by a biologist permitted by the U.S. Fish and Wildlife Service to handle Arroyo Southwestern toads.

The project will result in a temporary loss of 6.3 acres of riparian habitat in the Santa Margarita River drainage (including jurisdictional wetlands and waters of the United States), which provides habitat for the endangered willow flycatcher and vireo. Temporary impacts to riparian habitats, including mulefat scrub, southern arroyo riparian and southern willow scrub, will be mitigated through a combination of invasive exotic plant control and vegetation management to allow natural native species revegetation within five years. Restoration of temporary impacts will consist of invasive exotic plant control, measures to alleviate soil compaction that may occur during construction activities, and monitoring for a period of five years. The Marine Corps will monitor the effects of discharge elimination from sewage treatment plant 3 in the Santa Margarita Riparian system for 10 years to establish baseline data for areas upstream, adjacent to and downstream of the existing percolation basins. Hydrologic and vegetation monitoring data will be collected in accordance with the provisions of the Riparian Biological Opinion and provisions of the Clean Water Act Section 404 and 401 permits. Should changes in water quality or water levels be detected, the Marine Corps will consult with the San Diego Regional Water Quality Control Board and the U.S. Fish and Wildlife Service to develop and implement appropriate mitigation measures. No permanent or temporary riparian or wetland impacts are expected with project implementation within the San Luis Rey River drainage.

Critical Habitat for the Southwestern Willow Flycatcher has recently been designated by the U.S. Fish and Wildlife Service, including the 100-year flood plain of the Santa Margarita River. However, no permanent riparian/wetland impacts are expected from project implementation within the critical habitat area. Accordingly, the project will not adversely modify this habitat.

The California gnatcatcher (*Polioptilla california*), a federally listed threatened species, is present in the coastal sage scrub habitat near the percolation/equalization ponds and pipeline alignments. The project will result in a direct temporary impact

to 2.5 acres of the coastal sage scrub, of which only 0.80 acres are currently occupied gnatcatcher habitat. Mitigation and compensation for permanently removed occupied coastal sage scrub habitat (e.g., for the pipeline access road and the Lemon Grove ponds) will be achieved through habitat enhancement and management at a ratio of 2:1 in coastal sage scrub areas closest to the project impacts. The enhancement areas should stay free of any development or disturbance in the future. In accordance with the Biological Opinion 1-6-96-F-36 for the project (Upland Biological Opinion), coastal sage scrub habitat will be revegetated within two years of construction in all areas where permanent vegetation removal is not required (i.e., along pipeline alignments). Clearing of vegetation for the Lemon Grove ponds shall be done outside of the gnatcatcher breeding season (February 1 through July 31).

To the maximum extent possible, construction activities will be completed outside the California gnatcatcher breeding season to avoid indirect noise impact to the species. For construction that cannot be accomplished between August 1 and January 31, additional mitigation measures will be implemented in accordance with the Upland Biological Opinion. These include clearing of the vegetation prior to the breeding season, even if subsequent construction activities occur within the breeding season. This avoids the possibility of gnatcatchers nesting within the area that may be directed affected by the project. A pre-construction survey will determine whether any active gnatcatcher nests are within 500 feet of the pipeline corridor prior to construction activity. For those nests within 500 feet, a topographical analysis will be completed to determine if disturbance is probable. If so, then all work within 500 feet of a nest will be completed with a continuous 96 hour period.

To mitigate temporary impacts to coastal sage scrub habitat affected areas will be recontoured and reseeded with native coastal sage scrub species and non-native vegetation will be controlled for three years. This work will be initiated no later than the first growing season after the area is disturbed from project construction activities. Per the Upland Biological Opinion, this revegetation will be considered acceptable if the total cover by native coastal sage scrub species is at least 70 percent and the vegetation is not being artificially sustained, or if the Marine Corps can demonstrate to the satisfaction of U.S. Fish and Wildlife Service that the habitat is

insignificantly different from naturally occurring gnatcatcher habitats or fully functional coastal sage scrub on the Base.

A report summarizing habitat enhancement and restoration will be provided to the U.S. Fish and Wildlife Service within 60 days of the initial phase and after three years to document the success of the mitigation measures.

Thread-leaved brodiaea (*Brodiaea filifolia*), a proposed threatened plant species, has been identified along the construction corridor adjacent to the Headquarters alignment within the southern portion of the Base. Construction will result in the removal of a small population (five individuals plants) of thread-leaved brodiaea. The plant corms will be transplanted, prior to construction, to another suitable area on the Base that is presently occupied by the species.

Vernal Pools with associated watersheds have been identified near sewage treatment plant 2 along the project pipeline alignment. The pools and associated watershed adjacent to sewage treatment plant 2 will be fenced and monitored by a biologist. An erosion control plan will also be implemented to minimize dust, sedimentation, or siltation into the pools. This plan will be implemented by the contractor and reviewed and approved by the Base to ensure that the methods implemented are deemed effective. All pipelines will follow existing roads to the maximum extent practical.

Construction will affect three archeological sites determined to be eligible for inclusion on the National Register of Historic Places. The Marine Corps will prepare a treatment and data recovery plan for these three sites; CA-SDI 12,628, CA-SDI-14,0005H, and CA-SDI-14,170. A construction monitoring plan to include a discovery plan will also be prepared. The construction monitoring plan will also include monitoring for buried cultural resources within areas of Quaternary alluvium within the project alignment and at cultural resource sites CA-SDI-8761, CA-SDI-14,060, CA-SDI-14,058 and CA-SDI-14,059. Flagging of the right-of-way boundaries and construction monitoring will occur in the vicinity of cultural resource sites CA-SDI-12,567 and CA-SDI-12,577 to ensure avoidance of the significant site areas. Should archeological resources be encountered during construction, all work will be halted in the immediate area to determine if the resources are significant and whether excavation or protection of resources is required. The

California State Historic Preservation Officer concurs with this approach.

Analysis of air emissions that would occur during construction and operation of the percolation ponds determined that these emissions will be below *de minimis* levels and that the project conforms with the State Implementation Plan for air quality.

A Coastal Consistency Negative Determination was prepared and submitted for this project to the California Coastal Commission. The Negative determination concluded that the proposed action is being carried out in a manner consistent with the enforceable policies of the Coastal Zone Management Act. The California Coastal Commission and the City of Oceanside concur with this determination. A separate Coastal Use Development Permit was prepared and submitted to the City of Oceanside in compliance with the City of Oceanside Local Coastal Plan and the California Coastal Management Program. The Oceanside City Planning Commission has approved the Coastal Use Development Permit.

OCEANSIDE OUTFALL NOT IMPLEMENTED

The proposed action has been evaluated with respect to environmental and social impacts, as well as access to public information and an opportunity for public participation in the NEPA process as mandated by Executive Order 12898, "Federal Actions to Address Environmental Justices in Minority Populations and Low-Income Populations." The project is consistent with the goals and provisions of that Executive Order and no disproprotionate impacts to minority or low-income populations will occur.

In the event that the Marine Corps and City of Oceanside are unable to come to an agreement for connecting to the La Salina ocean outfall, the Marine Corps will utilize the new force main pipeline to collect treated effluent from sewage treatment plants 1, 2, 3 and 8 and dispose of treated effluent at percolation/equalization basins that will be constructed at the Lemon Grove site, as discussed in the FEIS. Also, as discussed in the FEIS, effluent diversion from sewage treatment plants 1 and 2 will be continued and be used primarily to irrigate the Marine Memorial Golf Course during the dry season, and a separate pipeline would be constructed (included within the 98,000 foot estimate) from the golf course to the new force main pipeline (to the Lemon Grove percolation/equalization ponds) to dispose of surplus irrigation effluent during the winter months. In addition, as discussed in the FEIS, effluent from sewage

16,000 LINEAL FEET OF THE 98,000 WILL NOT BE REQUIRED

treatment plants 3 and 8 would also flow to the Lemon Grove percolation/equalization ponds. Finally, treated effluent from sewage treatment plant 13 would continue to be discharged to the existing Twin Lakes equalization/percolation ponds; to the Santa Margarita River; and possibly to the Lemon Grove Ponds, capacity permitting. ~~Any continued discharge to the Santa Margarita River would be in violation of the Cease and Desist Order. Accordingly~~, continued discharge from sewage treatment plant 13 into the Santa Margarita River would require an upgrade to sewage treatment plant 13 to meet current permit conditions or a modification of the National Pollutant Discharge Elimination System permit granted to MCB Camp Pendleton by the San Diego Regional Water Quality Control Board. Implementation of any proposal to obtain a revised National Pollutant Discharge Elimination System permit or to add advanced treatment to sewage treatment plant 13 to comply with the existing permit conditions would require additional engineering and environmental analysis. Accordingly, subsequent environmental documentation would be prepared, as appropriate, pursuant to NEPA if the need arises to further pursue or continue discharge of treated effluent from sewage treatment plant 13 into the Santa Margarita River.

Preparation of the Environmental Impact Statement began with a public scoping process to identify issues that should be addressed in the document. Involvement in scoping was offered through a combination of documented public announcements and meetings with State of California agencies. Public announcements were handled through scoping letters sent to Federal, State, and local governmental agencies, citizen groups and associations, and the general public. Also, a Notice of Intent to prepare an Environmental Impact Statement was published in local newspapers and the Federal Register. The Notice of Availability of the DEIS appeared in the Federal Register on December 20, 1996. The DEIS was distributed to Federal, State and local governmental agencies, officials, citizens groups and associations, public libraries and other interested parties. The public review period for the DEIS was from December 20, 1996 through February 2, 1997. Comments received on the DEIS focused on alternatives analysis, groundwater recharge, endangered species and wetlands issues. The FEIS addressed these comments and was distributed to officials of Federal, State and local governmental agencies, citizens groups and associations, public libraries and to other interested parties on June 27, 1997. The public review period for the FEIS ended on July 27, 1997. No comments were received on the FEIS.

The Department of the Navy believes that there are no remaining issues to be resolved with respect to this project. In the event that the La Salina ocean outfall is unavailable, all pertinent issues have been identified and addressed. Questions regarding the Environmental Impact Statement prepared for this action may be directed to Mr. Lupe E. Armas, Assistant Chief of Staff, Environmental Security, Marine Corps Base, Camp Pendleton, CA 92055-5008, telephone (619) 725-4512.

8/26/97
Date

Mr. Duncan Holaday
Deputy Assistant Secretary of the Navy
(Installations and Facilities)

APPENDIX E
SHPO LETTER OF CONCURRENCE

STATE OF CALIFORNIA — THE RESOURCES AGENCY

PETE WILSON, *Governor*

OFFICE OF HISTORIC PRESERVATION

DEPARTMENT OF PARKS AND RECREATION

P.O. BOX 942896
SACRAMENTO 94296-0001
(916) 653-6624
FAX: (916) 653-9824

November 16, 1998

REPLY TO: USMC981028K.

Mr. Stan Berryman, Head, Archeological Resources Branch
Assistant Chief of Staff, Environmental Security
United States Marine Corps
Box 555010
Camp Pendleton, CA 92055-5010

RE: SEWAGE COMPLIANCE PROJECT (P-527B), LOWER SANTA MARGARITA BASIN, MARINE CORPS BASE CAMP PENDLETON, SAN DIEGO COUNTY

Dear Mr. Berryman:

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and the implementing regulations at 36 CFR Part 800, the U.S. Marine Corps (USMC) is continuing consultation with me concerning the above-cited project. Your letter dated October 28, 1998 transmitted a copy of *Draft Phase I Cultural Resources Survey Report, MILCON P-527B Sewage Effluent Compliance Project, Supplemental Environmental Impact Statement, Marine Corps Base Camp Pendleton, California* (York 1998).

I understand from your transmittal letter that five alternatives are currently under consideration for the undertaking and that Alternative 2 (i.e., Discharge of Secondary Effluent at Lemon Grove in Percolation Ponds with Vertical Drains plus Tertiary Treatment and Reclamation of a Portion of the Effluent) is the Preferred Alternative. I understand as well that an inventory and evaluation program was conducted and resulted in the finding of no historic properties within Alternatives 1, 2, 4 and 5. Within the area of potential effects (APE) of Alternative 3, however, five unevaluated archaeological sites are known to be present. These five sites include buried deposits of marine shell, flaked stone, bone, and other materials and were discovered during construction monitoring of a previous undertaking, the APE of which is adjacent to that of Alternative 3. These sites have been designated CA-SDI-15,170, CA-SDI-15,748, CA-SDI-15,749, CA-SDI-15,150, CA-SDI-15,751, and CA-SDI-15,752.

Staff review of York's 1998 draft report cited above indicates that reasonable measures were taken to identify historic properties within the APE of Alternatives 1, 2, 4, and 5 as described in that document. These efforts conform to applicable standards of adequacy. As for your findings concerning Alternative 3 (i.e., that there are five unevaluated archaeological sites within the APE of that alternative),

I agree that, prior to implementation of Alternative 3 (should it be selected) an evaluation of National Register eligibility must be conducted of each of these sites, in accordance with 36 CFR 800.4(c).

Because all of five alternatives have the potential to contain buried archaeological sites; the USMC proposes the development of a construction monitoring and discovery plan prior to implementation of the undertaking. If your agency determines that such a plan is warranted, I will be happy to direct my staff to review such a document and will transmit any comments resulting from that review to you.

Thank you for continuing consultation with me regarding this undertaking. If you have any questions regarding this letter, please contact archaeologist Chuck Whatford of my staff at (916) 653-2716 or calshpo.chuck@quiknet.com.

Sincerely,

M Zeitzberg for

Daniel Abeyta
Acting State Historic Preservation Officer